WEST VIRGINIA:

IN THE CIRCUIT COURT OF OHIO COUNTY

****

IN RE:

TOBACCO LITIGATION
(MEDICAL MONITORING CASES)

CIVIL ACTION NUMBER
00-C-6000

****

DEPOSITION OF RICHARD A. CARCHMAN, Ph.D.

September 22, 2000
10:00 a.m. - 12:40 p.m.

Richmond, Virginia

DEPOSITION CONTAINS HIGHLY CONFIDENTIAL INFORMATION OF PHILIP MORRIS, INC.

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REPORTED BY: Kurt D. Hruneni, CVR

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Deposition of RICHARD A. CARCHMAN, Ph.D., taken and transcribed on behalf of the Plaintiffs, by and before Kurt D. Hruneni, a Certified Verbatim Reporter and Notary Public in and for the Commonwealth of Virginia at Large; commencing at 10:00 a.m., September 22, 2000, at Hunton & Williams, Riverfront Plaza, East Tower, 951 East Byrd Street, Richmond, Virginia.

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I N D E X

WITNESS:

RICHARD A. CARCHMAN, Ph.D.

Examination by Mr. Evans 7

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LAWYER'S NOTES

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(10:00 a.m., September 22,2000)

RICHARD A. CARCHMAN, Ph.D.

was sworn and testified as follows:

E X A M I N A T I O N

BY MR. EVANS:

Q Good morning, Dr. Carchman. We've met before; I'm Jerry Evans from Ness, Motley, a law firm in Charleston, South Carolina, representing the Plaintiffs in this action.

MR. EVANS: Because we do have people here present in the room and people on the phone, I would like counsel to identify themselves on the record, if you don't mind.

MR. KLEIN: Sure; my name is Sam Klein, from Dechert. We're representing Philip Morris and the witness.

MR. GADDES: Andrew Gaddes.

MR. MATTOCK: Bruce Mattock, by phone, from Goldberg, Persky, Jennings & White, representing the Plaintiffs.

MS. KANDZARI: Pamela --

MR. GADDES: Andrew Gaddes from Dechert.

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MS. KANDZARI: Sorry.

MR. GADDES: Also representing Philip Morris.

MS. KANDZARI: Pamela Kandzari, Allen, Guthrie & McHugh, representing Philip Morris locally.

MS. GREY: Kerry Grey, Hunton & Williams, representing Philip Morris.

MR. EVANS: Anyone else?

Great.

MR. SHERE: This is Fazal Shere, from Bowles, Rice, McDavid, Graff & Love, representing R.J. Reynolds locally and the fellow Defendants.

MS. FRYE: Lynn Frye, Jackson & Kelly, representing Brown & Williamson.

MR. EVANS: I think that gets everybody; thank you.

BY MR. EVANS:

Q Dr. Carchman, as I said, we have met before. And I have, in fact, taken your deposition before. Let me just briefly go over the ground rules.

I'll be asking you questions. If at any time you don't understand my question, please let me know.

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If I do ask a yes or no question, I would ask that you if at all possible give me a "Yes.", "No.", "I don't know.", answer, and then proceed to give whatever explanation you feel is appropriate.

If you need to take a break at any time, please let me know. And I'll be happy to accommodate you.

Are you under any infirmities at all this morning that might impair your ability to give testimony?

A No.

Q Are you taking any medication that would affect your ability to answer questions today?

A No.

Q Okay; I last took your deposition, Dr. Carchman, in the case of Labelle versus Philip Morris in July. And I'd like to ask you if since that time you have been in any other depositions.

A Yeah; I believe the answer is yes.

Q And what case would that be in?

A It might be the Proposition 65 ETS case, taken in San Diego, California.

Q Is that a case challenging a Proposition, Proposition 65?

Or let me rephrase that. Can you describe

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for me in general terms what that case is about?

A No, I can't. My testimony was taken involving smoking and health issues, touching upon environmental tobacco smoke and Philip Morris, Philip Morris' efforts in that area.

Q Okay; have you given any trial testimony in the time period since July?

A I don't believe so.

Q Did you bring any documents with you to the deposition today?

A No, sir.

Q Do you have, sir, a file of correspondence relating in any way to this case?

A Yes.

Q Did you see the schedule of documents that was attached to the Notice of Deposition for this deposition today?

A I believe so.

Q Okay; and I believe it asked for your file on this case, including all correspondence, notes, draft reports, and other materials which may be relevant to your opinions in this case.

So do you, in fact, have documents that would be responsive to that request?

A I believe you have all of those documents in

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the form of my expert statement and my resume.

Q Okay.

A And -- forgive me -- and the information that I, in part, used as the basis for some of my opinions, a listing of publications and documents.

Q Oh, yes, sir; I know what you mean by that. Thank you

MR. KLEIN: And for the record, Dr. Carchman has provided us with an updated curriculum vitae.

MR. EVANS: Okay; thank you.

MR. KLEIN: Which I'm now handing to Mr. Evans.

BY MR. EVANS:

Q Dr. Carchman, have you prepared any billing statements relating to your work on this case?

A No.

MR. EVANS: All right; counsel for Philip Morris has handed me an updated curriculum vitae for you, which I will ask the Court Reporter to mark as exhibit number one.

(Deposition Exhibit No. 1 was marked.)

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BY MR. EVANS:

Q And Dr. Carchman, I actually have another C.V. that was provided earlier. If you don't mind, if you'll give me just a moment to make a comparison of these documents.

(Mr. Evans reviewed some documents.)

Okay; thank you, sir.

MR. EVANS: I think the easiest thing would be to do if I also have the Court Reporter mark this disclosure statement and curriculum vitae that was provided to Plaintiffs' counsel earlier.

(Deposition Exhibit No. 2 was marked.)

MR. EVANS: Thank you; do you need copies of this?

BY MR. EVANS:

Q Okay; Dr. Carchman, your present position is listed as Retired Vice President. Or I should say the most recent position listed on this resume is Retired Vice President of Philip Morris USA.

Is that still an accurate description?

A Yes, sir.

Q And I believe you also do consulting work

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for Philip Morris; is that true?

A Yes.

Q Okay; are you still associated in any way with the Medical College of Virginia?

A Yes.

Q And are you teaching there at this time?

A Teaching in the sense I serve on four graduate student committees as an advisor, and attend regular meetings with the students and other faculty, and go over their research and writings and make recommendations.

To that extent, yes. Am I teaching formal courses? No.

Q Any plans to teach a formal course?

A Possibly.

Q But has a particular course been discussed with the Medical College?

A With neither of the two chairmen of the two departments I serve in; not yet.

Q Okay.

A I take that back. I take that back.

I discussed teaching some molecular pharmacology courses with the then chairman of pharmacology and toxicology.

He has since left to go back to the N.I.H.

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So it's sort of in limbo. I have to speak to the new chairman.

Q Okay; I'd like you to turn to -- on what we've marked as exhibit number two, which is the resume that I was previously provided, and ask you to turn to page nine, where it lists "Publications (Peer Reviewed)".

Do you have that?

A Yes, sir.

Q And just ask you to take a look at that, and tell me if there are any new items that should be included on this list.

A On page nine?

Q On page nine, under manuscripts -- publications; excuse me.

A I don't think so.

Q Okay; have you reviewed any of the pleadings in this case, doctor?

A A pleading is what?

Q Any Court documents, the Complaint or any sort of documents filed with the Court in this case.

A I have been shown the Complaint.

Q Okay; what is your understanding then of what the Plaintiffs are asking for in this lawsuit?

A And forgive me; I mean, it -- most of the

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Complaint was legal, a lot of legalese. But -- and this may be naive and even incorrect.

But my impression of this is that the Plaintiffs are asking, in part, for funds from the Defendants to provide medical monitoring for certain kinds of smokers.

Q Have you read any expert reports by any of the Plaintiffs' experts in this case?

A No, sir.

Q Okay; how about any expert reports other than your own from Defendants' experts in this case?

A I don't believe so.

Q No; okay.

And have you met with any attorneys in preparation for today's deposition?

A Yes.

Q And when did that meeting take place?

A Yesterday.

Q Were there any other meetings, or just yesterday?

A Just yesterday.

Q And who did you meet with?

A Mr. Klein, Mr. Gaddes, and Mrs. Nye, Dyanna Nye from Shook, Hardy.

Oh, sorry; one more. Jim McNasby from

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Philip Morris.

Q Okay.

A I don't know how I forgot him.

Q When you say from Philip Morris, is Mr. McNasby an in house counsel to Philip Morris?

A Yes.

Q Okay; and about how long was that meeting?

A Oh, from approximately 9:30 in the morning until 3:00, 3:30 in the afternoon.

Q Is that the time that you were shown the Complaint in this case?

A Yes.

Q Were you shown any other documents?

A I believe I was.

Q Can you remember what they were?

A I don't believe they were things that I had not seen or heard about before.

Q I mean, even if they were things you had seen before, can you in a general way describe the sort of documents you saw?

A I've only had two cups of coffee. It may be too early to ask me that.

Q Well, perhaps we'll come back to that question.

A Okay.

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Q You mentioned Mr. McNasby as being an in house counsel for Philip Morris.

Did you meet with any other employees of Philip Morris concerning your testimony in this case?

A No.

Q Okay; in your role as a consultant, do you bill your time at an hourly rate?

A No.

Q Are you then under a salary position?

A No; if I can try to explain.

Q Please do.

A I charge a per diem. And if I work half the day, I'll charge half that per diem or a quarter of that per diem.

But if I work twenty hours, it's still one day. So it's not eight hours. It's just -- I don't charge per hour, but I have adjusted my charges to the company.

If I only put in two hours worth of work, I only charge a quarter of a day. If I put in eight hours, I charge a full day.

If I put in twenty hours, I charge a full day.

Q How many days or portions of days, if you know, have you spent devoted to your work on this case?

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A Oh, specifically as it relates to this case, yesterday and today. Having said that, the scientific and technical preparation basically involves everything I've done for the last thirty-six years related to my areas of expertise over that period of time.

So depending on the questions that -- technical questions you ask me, I may rely upon things that I have learned or created over more than three decades of education, training, and learning.

So it's hard to, in my own mind at least, clearly answer that, in terms of how much time I've devoted.

I would only bill Philip Morris for two days. But in terms of my expertise and training, etcetera, it involves my entire professional career.

Q I understand.

You do consulting work for Philip Morris beyond just work in a litigation context such as this; isn't that correct?

A This actually the minor part of what I do.

Q Okay; about what percent of your consulting time would you say is spent on litigation matters such as this?

A Twenty percent.

Q And then what sort of activities would

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comprise the other eighty percent? And again, I'm talking about consulting for Philip Morris.

A I understand, Mr. Evans.

The rest of my effort has primarily dealt with Dr. Solana's program. Dr. Richard Solana is Vice President of Worldwide Scientific Affairs.

And he has responsibility for Philip Morris on a worldwide basis dealing with all smoking and health issues.

And I at his request serve a number of technical and advisory roles to him in this regard. And that's the other eighty percent.

Q Okay; Dr. Carchman, does cigarette smoking increase an individual's risk of contracting heart disease?

A I believe so; yes.

Q Okay; does cigarette smoking increase an individual's risk of contracting lung cancer?

A Yes.

Q Same question for cancer of the stomach.

MR. KLEIN: I'm going to object to the relevance of that. Certainly, you can answer it. It has nothing to do with this case whatsoever.

THE WITNESS: Number one, if it does, it's not at the same level as the other two types of

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diseases you've mentioned.

I believe, personally, that it doesn't. But there are some people that continue to believe it somehow contributes to that.

BY MR. EVANS:

Q And does cigarette smoking increase an individual's risk of contracting bronchitis?

A If you were more specific and said what kind of bronchitis, I'd be able to answer -- able to answer your question.

Q Okay; based on your knowledge of smoking and health science, what particular types of bronchitis -- excuse me -- cigarette smoking would increase an individual's risk as to what particular types of bronchitis?

A Chronic bronchitis.

Q And does cigarette smoking increase an individual's risk of contracting emphysema?

A Yes.

Q Would smoking cigarettes manufactured by Philip Morris increase an individual's risk of contracting heart disease?

A Yes.

Q And the same question as to lung cancer.

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A Yes.

Q You've testified before about a reference cigarette known as the Kentucky reference cigarette.

You know what I'm referring to there?

A Yes, sir.

Q Okay; is it possible for a consumer to purchase a Kentucky reference cigarette?

A Not in any commercial market that I'm aware of.

Q Okay; to your knowledge, would smoking a Kentucky reference cigarette increase an individual's risk of contracting heart disease?

A Yes.

Q And lung cancer?

A Yes.

Q Okay; does cigarette smoking expose the smoker to proven hazardous substances?

MR. KLEIN: Objection to the form of the question.

THE WITNESS: You need to help me on two parts of your question. One is "proven"; and the other is what you mean by "hazardous".

BY MR. EVANS:

Q So the way I phrased the question is not one

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that you can answer?

A It --

MR. KLEIN: Objection; because I've objected to the question, and he's already answered that.

You can answer.

THE WITNESS: I need context.

BY MR. EVANS:

Q Okay; does the length of time a smoker smokes affect the level of risk of contracting heart disease?

A It is one of the factors, though not the most important factors, that needs to be considered.

Q Okay.

A But it is a factor that has a contribution, but not the largest contribution.

Q Will you offer any expert opinion on the length of time smoking, as it affects a person's risk of contracting disease?

MR. KLEIN: Objection.

You can answer.

THE WITNESS: I might.

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BY MR. EVANS:

Q And your opinion would be, as you stated before, that it is -- I don't want to mis-phrase it, but it is a factor, but not the largest factor?

MR. KLEIN: Objection to the form.

You can answer.

THE WITNESS: That's correct.

(Discussion off the record.)

BY MR. EVANS:

Q Okay; Dr. Carchman, I'm going to ask the Court Reporter next to mark a document that my office received a couple of days ago, which is identified as, "a list of Dr. Carchman's reliance materials", and ask you to take a look at that, please.

(Deposition Exhibit No. 3 was marked.)

MR. KLEIN: While the doctor is looking at that document, there were two items which were inadvertently left off of the reference -- off of the document list.

MR. EVANS: Okay.

MR. KLEIN: Which I will now give to you.

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MR. EVANS: Thank you.

MR. KLEIN: Number one is a book called Modern Epidemiology, written by Rothman and Greenland, or at least edited by Rothman and Greenland in 1999.

And the second addition to the reliance list is the presentation and submissions to the Institute of Medicine made on March 1, 1999.

(Discussion off the record.)

MR. KLEIN: The witness has questioned the accuracy of my March 1, `99, date. We'll look into that.

THE WITNESS: It was this year.

MR. KLEIN: It may be 2000.

MR. EVANS: Okay; I understand that this -- okay -- presentation --

MR. KLEIN: I understand that it was 2000.

MR. EVANS: Okay.

MR. KLEIN: So I apologize.

THE WITNESS: Sorry.

BY MR. EVANS:

Q Dr. Carchman, if you'll just take a look at

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what I've asked the Court Reporter to mark as number three.

A Uh-huh.

Q And confirm that this is a list of your reliance materials.

A So far, it appears to be; yes.

MR. KLEIN: I'd note for the record that you're asking him to look at a thirty-eight page document listing in excess of seven hundred and eighty-three documents.

THE WITNESS: (The witness reviewed a document.)

This looks like it.

BY MR. EVANS:

Q All right; thank you.

Doctor, how did you go about selecting the documents for inclusion on this list?

A It represents a distillation of many years of -- for the scientific documents, published documents, published books and reports, it represents many years of selecting out what is a much larger list than this and saying these are the kinds of things that helped form my opinions on certain pieces of information, or certain facts and/or things that I directly participated in that

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I felt were or could be germane to this, or some internal -- internal documents that could be of value in further illuminating some positions and/or questions.

For some things, I don't have -- I still don't have answers to. But the points that are raised in there remain illuminating or interesting, at least.

Q And you mentioned certain internal documents.

Did you select those?

A I may have included some things in here after some discussion with some of my colleagues. So, for instance, if I see here, 128, Accord kit and cigarettes, that's on page seven, 1998, maybe in a conversation with Rick Solana or somebody else they said, "You know, if you're going to talk about this, it might be nice to show somebody what this is."

So I probably would not have done that without having a conversation with somebody. I'm not saying it was Dr. Solana.

But some of this, I believe, found its way in here based on some conversations. But the vast majority of -- the overwhelmingly vast majority are things that I believe are important.

Q Counsel for Philip Morris has added a couple of things to the list. But let me ask you, if you know,

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when the most recent time this list was updated or things were added to this list, with the exception of the two that were added this morning?

A Yeah; I think you can look at the date. So, for instance, there is the `98 Health Canada report which wasn't published until 1999.

Modern Epidemiology is a book that I've been using. This is the 2nd Edition. So I've been using the 1st Edition for ten years.

The 2nd Edition, I've been using since it -- since it was published. So I think just looking at the dates, you can get an idea when these things were added.

I believe this is the same reliance list, if that's the right term --

Q That's the term we use.

A Thank you.

That reliance is the same one I used in a Blue Cross/Blue Shield deposition. So number 613, 613 on page thirty, is the Health Canada report that I was referring to. And that would have been 1999.

Q Well, that brings up my next question, actually.

Do you know the way that these documents have been ordered, why they are in their numbering sequence of 1 through 783?

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A No; I did not type this. I don't know why it was done this way, and what these beginning and end dates -- I can only speak to the substance of the documents, not in the way this was put together.

Q Okay; when I asked you about the things that had been added, you mentioned things that have a very recent publication date.

Can you recall any more historical documents or older documents that, in the last couple of months say, you have asked to be added to your list of reliance materials?

A Shew; if you'll give me a moment.

Q Please.

A (The witness reviewed a document.)

The question is in the last several months?

Q Yes.

A Okay.

(The witness reviewed a document.)

And that's in -- that would not be -- you wouldn't be talking about the Institute of Medicine submission that's included here? Would that be --

Q Well, no; and let me back up just a little bit. I realize that there are recent publications that have been added.

A Uh-huh.

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Q But my question was geared toward if there were documents of an earlier date, more historical documents, that you can recall that you have asked to be added to your list?

A Not that I can recall at this time.

Q Okay.

A Sorry.

Q That's all right.

Doctor, if you'll turn to what we earlier marked, I believe, as number two.

A What is two?

Q The disclosure sheets attached to your resume.

A Thank you.

Q The front page of what we marked as exhibit number two, doctor, is a list of your testimony -- a description of your testimony that was provided as your expert disclosure in this case.

And let me ask you to take a look at that page and ask you if you recognize it.

A Yes, I do recognize it.

Q And did you prepare this page?

A This was prepared for me based upon previous expert disclosures that I have made. And it's a sort of a mini-version of what I have done before.

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But if I look at the other models that I've used for this, this is almost word for word. It's just a much smaller version.

Q Okay; I'd like to focus on the second paragraph. It says, "Dr. Carchman is a fact witness. He may also offer expert testimony in the following areas:".

And I would like to go through these areas with you, please. The first one listed, it says, "past and present scientific knowledge relating to smoking and health".

I asked you earlier whether cigarette smoking increasing an individual's risk of contracting certain diseases.

Let me ask you now, how long has it been known that cigarette smoking increases a person's risk of contracting lung cancer?

A In the United States, I think for men that was around 1964.

Q And how long has it been known that smoking increases a person's risk of contracting heart disease?

A In that same period of time.

Q It says you may offer expert testimony on the past and present scientific knowledge relating to smoking and health.

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How far back, historically, are you prepared to offer opinions as to the state of the scientific knowledge relating to smoking and health?

A I can talk about some of the observations made in the early 19 -- 18th century -- sorry -- 20th century, up to the present.

Q What observations in particular from the early 20th century are you referring to?

A Some -- a variety of publications from Europe, for example, Germany in particular during the 1930's -- 1920's and 1930's that made some very interesting observations about tobacco and tobacco smoke, not limited to cigarettes.

Q Any others from the early 20th century?

A Not that I can recall at this time.

Q Okay; is the scientific knowledge relating to smoking and health greater now than it was one year ago?

MR. KLEIN: I object to the form of the question. I'd ask that you define scientific knowledge about smoking and health.

MR. EVANS: Well, I'm going to stay with the question. I note your objection.

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BY MR. EVANS:

Q You are opining, Dr. Carchman, on past and present scientific knowledge relating to smoking and health, using your words.

So my question, is scientific knowledge relating to smoking and health greater now than it was a year ago?

A No; and the reason for my answer, trying to stick with the template you have laid out of yes or no with an explanation, is there are more facts and there's more data.

Whether there is more knowledge or not, I think, remains to be seen. There are more scientific, medical and technical publications on facts that provide data and information.

Whether that actually translates into knowledge, which for me provides insight and true understanding into some phenomenon or phenomena, for me at this point to answer your question as of a year ago, my answer is no.

Q Okay; well, let me go another increment.

Is scientific knowledge related to smoking and health greater now than it was five years ago?

A Yes.

Q Give me an example of the progress in

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knowledge relating to science and health from five years ago to one year ago.

A Okay; and you can't hold me to 1995, we're talking plus and minus a couple of years.

Q I understand.

A For example, and this is just one example, there has been a hypothesis that people smoke cigarettes for nicotine, and that they continue to smoke cigarettes because not to smoke cigarettes creates an unpleasant situation for the smoker that has been called withdrawal.

And that's been a hypothesis that's been around and probably still is around in some people's minds.

Within the last year or two, there have been some important publications, in part by government scientists, but clearly sponsored by the U.S. Government, by the National Institute on Drug Abuse, that says it's more complex than that.

For example, if you want me to, I can give you some more specifics on that. But since you're not objecting, I'll just very quickly tell you that this study, which was published in a prominent tobacco control journal, took smokers and in a double blind fashion had them abstain from smoking for three hours or

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overnight.

And then without either the investigator or the smoker knowing, gave them one of two cigarettes that they couldn't tell, looking at them, apart.

One was a regular cigarette, and the other was a fully de-nicotinized cigarette. A number of observations were made on these subjects, including some parts of the Fagerstrom [ph] questionnaire response, which looks at withdrawal.

The conclusion of the authors -- because the hypothesis would have been that in those smokers who had abstained from smoking, if that hypothesis were true, you should be able to pick up some of these withdrawal symptoms.

And the authors concluded that they couldn't tell any difference between the two. And so, obviously, there is more to smoking than just nicotine.

I would say that's a very interesting observation with some interesting data, that actually may represent another piece of something I would call knowledge.

Q Okay; who conducted that double blind study?

A I don't remember the name of all of the authors. But Dr. Jack Henningfield was a co-author of that study.

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I don't believe that's on my reliance list. But it's available in the peer reviewed literature.

Q The next phrase in the areas you may offer expert testimony in says, "the pharmacology of nicotine, including Philip Morris' internal and external research regarding the pharmacological effects of nicotine".

Have I read that correctly?

A Yes, sir.

Q Okay; how long has Philip Morris conducted internal research on the pharmacological effects of nicotine?

A There was a period of time internally I would guess from some time in the seventies to the middle to late eighties.

Q Did it stop in the mid to late eighties?

A The internal work on the pharmacology of nicotine pretty much came to a stop at that time.

Q And when we're talking about internal research, do you mean actually conducted in a Philip Morris laboratory, on site?

A That's my use of the term.

Q That's what I thought; okay.

Now, how long has Philip Morris conducted external research? Or maybe conducted is the wrong word.

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But how long has Philip Morris been involved in external research regarding the pharmacological effects of nicotine?

MR. KLEIN: Objection to the form of the question.

THE WITNESS: Our support of external research in this area continues to this day, and goes back decades.

BY MR. EVANS:

Q Can you be more specific than "decades"?

A In the sixties, at least.

Q So predating Philip Morris' internal research, which I believe you said dates from the seventies, is that correct?

A I believe that's correct.

Q Okay; what did the 1964 Surgeon General's report conclude about the pharmacological effects of nicotine?

A I believe that, if I remember correctly, it dealt with dependence.

Q Can you be more specific as to the conclusions of the Surgeon General?

A They did not embrace the concept of addiction. It was a different type of relationship.

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And this was consistent with some other work that was being done internationally with the W.H.O., where smoking and if one wants to talk about nicotine did not fulfill those particular requirements.

So they -- I think they called it dependence. They may have had an additional word to describe it.

Q Okay; and you talked about Philip Morris conducting internal research from the seventies to the mid to late eighties.

My question, what did Philip Morris learn from its internal research on the pharmacological effects of nicotine that was different from or expanded on what the Surgeon General had to say in 1964?

A Yeah; there are three parts to my answer.

Q Okay.

A One, that science as a whole in that area, since 1964, did not stand still outside of what was going on or might have been going on in Philip Morris.

So there was a lot of work in this area by a variety of investigators around the world.

Number two, Philip Morris carried out two kinds of evaluations on the pharmacology of nicotine. One I would call and I have called as being totally derivative.

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That is, doing what other people had already done and published.

And the other was actually conceptually really quite different, and could have had, I think, some profound impact in helping the basic understanding of nicotine pharmacology.

And I'm referring specifically to the nicotine analog program. Though it was not the objective of the -- stated objective of the program, what I'm talking about.

I think, as an unintended consequence of that, if they would have found some of the things they were looking for, it could have been very illuminating in terms of providing something very important in understanding what's going on with nicotine pharmacology.

So those are the three things that were going on internally. I hope that answers your question.

Q I think it did.

And the third one you were talking about, the nicotine analog program, you described that as things it could have accomplished.

If you would explain to me why this did not eventually accomplish what it was set out to do.

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A Okay; the specific objective was to identify a nicotine analog or analogs that had -- that you could make.

And so Philip Morris had some of the world's leading organic -- synthetic/organic chemists working on this.

And they published on this, they presented on this, and they patented all of this, trying to create a nicotine analog that had special properties.

And those special properties that the program was looking for is that it would have -- continue to have central activity, the brain, the nervous system, but not have peripheral activity, primarily cardiovascular.

So they wanted to see if they could make something that could somehow separate what has not been separable.

And so they synthesized dozens of these compounds. And they had them tested in a comprehensive program that had both internal and external people working on it.

But it was an internally driven program that had significant components of internal scientists working on this.

So you had people looking at the central

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nervous system pharmacology of nicotine, and you had people looking at the cardiovascular and peripheral pharmacology, receptors, and that was both inside and outside -- inside and outside the company.

Unfortunately, none of the compounds -- none of the compounds that were ever synthesized achieved that objective.

If they would have been able to make such a compound, putting aside what Philip Morris' notions might have been of its usefulness, from a fundamental research prospective, it would have been at that period of time a very innovative and groundbreaking type of observation.

Unfortunately, they failed to find such a compound. They failed to synthesize such a compound and find one.

If it was active in the central nervous system, it was active peripherally. If it was inactive in the central nervous system, it was inactive in all the tests that they looked at.

Q So does Philip Morris use a nicotine analog in any of its cigarettes currently?

A As far as I know, they never have, nor do they now.

Q And as far as you know, has any cigarette

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manufacturer been able to use a nicotine analog in any of its cigarettes?

A I have no way to answer that question.

Q Okay; and what is the time period that Philip Morris' internal research on the nicotine analog was going on?

A From some time in the seventies, and ended in the early to mid eighties.

Q Okay; and so I think actually what you were just discussing covers the next statement in your list of opinions, "issues related to Philip Morris' internal and external research concerning nicotine analogs".

A Yes.

Q Correct?

A Yes.

Q Okay; let's move to the next one. It says, "current and historical research activities, including research conducted by or for Philip Morris".

That phrase seems a little broader than some of the others. So let me just ask you, what opinions do you plan to offer on the current and historical research activities conducted by Philip Morris?

MR. KLEIN: Objection to the form of the question.

THE WITNESS: It involves both our

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interactions with scientists on a worldwide basis, whether they be at universities, colleges, or institutes, or with governmental agencies either in the United States or in other parts of the world.

And some of them were part of concerted government, U.S. Government, efforts; for instance, the Tobacco Working Group.

That would be some of the historical information that I would speak to.

As well as some of the current work, either with Health Canada, which continues today; with the Departments of Health, primarily in the Commonwealth of Massachusetts with Dr. Greg Connelly; with work going on with the Institute of Medicine, which is -- where they're being responsive to a U.S. Food and Drug Administration request; to communications with the World Health Organization, with the European Union.

There are some others, bu those are the main ones. And they all deal with scientific interactions between Philip Morris scientists and outside scientists dealing with a variety of research activities, including what you then -- what I then have here.

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BY MR. EVANS:

Q Okay.

A Okay.

Q Well, let's keep going, and maybe we can fill in some of this. Again, the next phrase -- and just continuing in this sentence, the next phrase says, "development of cigarettes with lower `tar' and nicotine yields, and the scientific studies addressing the health effects of filter and low-yield products".

Have I read that correctly?

A Yes, sir.

Q Okay; what is the current lowest yield product that Philip Morris sells?

A Based on FTC machine derived deliveries, I believe it's a one milligram product in the Merit family called the Merit Ultima.

Q What's the highest delivery product that Philip Morris currently sells?

A I believe there -- and I'm not necessarily the right person to do this, so I may be off somewhat. But, for example, there are some non-filtered cigarettes that Philip Morris sells, if it still sells them, English Ovals being one example.

And I believe it's FTC derived machine delivery may approximate twenty to twenty-five

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milligrams of tar.

But I could be --

Q Okay; do you know what the highest yield cigarette among Philip Morris' filter cigarettes is?

A In the United -- yes; sorry.

Yes; in the United States, we sell products that, again using the Federal Trade Commission machine derived analysis, yield tar deliveries in the fifteen to sixteen milligram tar range.

Q And what brand or brands is that?

A Well, for example, Marlboro Red is in that category.

Q It says you'll talk about the health effects of filter and low-yield products.

What are the health effects of a filter on a cigarette?

A The -- what I am prepared to discuss is an evaluation of both -- well, an evaluation of chemical and biological, animal and in vitro data that's been published on filters and things related to filters versus non-filters, and analyses of the published epidemiological data that exists in which this question has been examined.

So I have both human data, based on epidemiology, chemistry data, animal data, and

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in vitro -- in vitro, test tube data.

Q And based on that data, can you conclude that a filter on a cigarette makes it safer than a non-filter?

A No; I can't, using your words, safer. I can only talk about what would appear to be a reduction in risk.

Q Okay; but based on the data you were referring to, does a filter cigarette result in less risk to the smoker than a non-filter cigarette?

A The answer is it may, or it can. But one has to provide a richer context to put this in.

If I might, just very quickly, the epidemiology data since the sixties continues in general to report a reduced relative risk or odds ratio for lung cancer, comparing smokers of filter and non-filter cigarettes; okay?

But if you have somebody that smokes three times as many filter cigarettes as non-filter cigarettes, you obviously obviate any benefits that you might have achieved in terms of this analysis, just as an example.

So you need to provide a richer context to really appreciate the -- what an answer to such a question might entail.

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Q Okay, doctor; what are the health effects of low-yield cigarettes?

A The health effects of low-yield cigarettes are qualitatively the same as those of the higher yield cigarettes.

Q Does that mean, based on your analysis of the data, that the low-yield cigarette is no safer than the high-yield cigarette?

A Again --

MR. GADDES: Mis-states what he said.

THE WITNESS: Thank you.

This question of safer, again, one has to provide a more complete context.

The epidemiological data says you can demonstrate a reduction in risk, but depending upon the context of the use of the product and other factors relating to the individual.

In the absence of having that information, I don't think it's answer-able, other than to say I generally agree with the U.S. Surgeon General's position on low tar cigarettes and lung cancer.

BY MR. EVANS:

Q Well, in your opinion, does the smoker of the low-yield cigarette enjoy any health benefit over

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the smoker of the high-yield cigarette?

A As -- I agree with what the U.S. Surgeon General has said in this regard, specifically with respect to lung cancer.

That there appears to be a risk reduction in smokers of low tar, but they are minimal. And the best thing that any smoker can do, using these kinds of products, is to stop, is to stop smoking.

So there's a numerical change. But the residual risk from a public health perspective is still too large.

Q What's the numerical change?

A Okay; if you do a meta analysis of the dozens of studies that have been published on this -- and I'll try to make it simple -- comparing filter and non-filter, for men, you see about a halving of the risk.

But the residual risk is still a very large number.

Q I want to move on to the next part of this statement. It says you may offer expert testimony on "the design and construction of cigarettes".

While you were at Philip Morris, did you ever participate in the design of cigarettes?

A From the very beginning, actually as a

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consultant, I was consulting with the company with regard to the ingredients added to tobacco in the manufacture of cigarettes, which was and remains an important design component.

For all of the non-conventional products, I was involved pretty much up until the time I retired with all the component elements that went into the design, as well as testing those prototypes.

So I think the answer is yes. And when the product -- the development people came up with some new ideas and/or there was interaction with other scientists, I was -- or people that worked for me were party to those discussions.

Q Okay; were you ever involved in the construction of cigarettes?

MR. KLEIN: Objection to the form of the question.

THE WITNESS: Did I ever, hands on, do that? No.

But did I make recommendations about what to use and what not to use, or how to use it or how not to use it? Yes.

BY MR. EVANS:

Q Okay; and when you -- if you offer testimony

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about the construction of cigarettes, would it involve those recommendations you were just referring to, that sort of thing?

MR. KLEIN: Objection.

THE WITNESS: Could you repeat the question, please?

BY MR. EVANS:

Q Well, when I asked if you'd been involved in the construction of cigarettes, you said you had made recommendations.

Now, referring back to your statement of opinions that you may offer, if you offer any opinions about the construction of cigarettes, will you be referring to the sort of design recommendations that you were talking about earlier?

MR. KLEIN: Objection.

THE WITNESS: I think I could very well.

BY MR. EVANS:

Q Will you be offering any opinion as to the effect on a smoker's health of the design and construction of cigarettes?

MR. KLEIN: Objection.

THE WITNESS: Insofar as we know the

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answers or guesses to that, I might.

BY MR. EVANS:

Q Okay; in your opinion, does the design and construction of cigarettes impart a benefit to the smoker in terms of health?

MR. KLEIN: Objection to the form of the question.

THE WITNESS: I'm not sure I understand your question. Could you repeat it, please?

BY MR. EVANS:

Q Does the design and construction of a cigarette have an impact on the health risks to the smoker?

A And I would say that is in -- at the heart of the product development program at Philip Morris, to try to develop less riskier products.

So to the extent that, given our understanding or anybody's understanding in terms of what it is you can do with this kind of product that might reduce the risk, that's what they've been working on for decades.

Q Have they succeeded in -- through design and construction, I'm talking about now. Has Philip Morris

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succeeded in making a cigarette that is more beneficial in health terms to the smoker?

MR. KLEIN: Objection as asked and answered in the whole last series of questions.

But you can answer it again.

THE WITNESS: And by beneficial, we're still talking about less riskier?

BY MR. EVANS:

Q Yes.

A Okay; I would say I don't really know the answer to that question.

Q The next statement here, it says you may offer expert testimony on, "issues related to molecular biology/carcinogenesis, comma, issues related to internal and independent assessment of the ingredients/ additives used in the manufacture of cigarettes, comma, including their purpose and chemical and physiological effect".

Have I read that correctly?

A Yes.

Q And I want to make sure that this is all sort of one area that you intended to group together. Or should this be broken down into parts?

Is the "issues related to molecular biology

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slash carcinogenesis", is that sort of an independent area from the issue of ingredients and additives?

A In -- for the most part; yes.

Q Okay; so let's break them apart. Issues related to molecular biology and carcinogenesis.

Will you be talking about the carcinogenesis of cigarette smoke?

A I may very well talk about that.

Q Okay; what are the recognized carcinogens in cigarette smoke?

A The carcinogens that have been found in cigarette smoke have been reported in a number of documents from the World Health Organization, for example, the International Agency for Research on Cancer, in their volume thirty-eight, 1985, 1986.

Up to a more recent one, publications by Hoffman, for example in the Consumer Product Safety Commission.

And there are really two kinds of carcinogens. There are those things that are animal carcinogens, that is, things that may be administered by various routes of exposure, not necessarily inhalation, that have been reported to produce some kind of cancer in some animal by some route of exposure.

And that's actually the majority of the

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things that are found as carcinogens in smoke.

Then there is a smaller class that have been designated as known human carcinogens. But they've been designated as such not because they're found in tobacco smoke, but primarily based on the fact that at high occupational exposures they are associated with certain kinds of tumors.

And so those are the two kinds. So there may be four dozen carcinogens in -- found in tobacco smoke, or have been reported in tobacco smoke by somebody, somewhere in the world.

The vast majority are animal carcinogens. But a small -- but a dozen or so listed as known human carcinogens found in tobacco smoke.

Q Okay; I want to make sure I understood. I got a little confused in your answer.

Among the human carcinogens, I thought earlier in your answer you said they're listed not because they're found in tobacco smoke; is that correct?

A They are listed as known human carcinogens, not based on any evidence from smoking, but based on -- I'm sorry; it was probably my -- but based on occupational exposures to these compounds.

For instance, in a rubber manufacturing or

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in a mining or in a petrochemical facility, that really is the fundamental basis that allowed that nomenclature.

Not because, yes, you can find vinyl chloride in tobacco smoke. But that's not how it got the designation of known human carcinogen.

It got its designation based on human occupational studies in some kind of a manufacturing environment.

Q Well, but to take vinyl chloride as an example, is it correct that it is a human carcinogen?

A It is listed as a known human carcinogen, primarily producing a very rare form -- rare form of a liver cancer.

It is the signature attribute in the human occupational studies with vinyl chloride.

Q And is it found in cigarette smoke?

A Yes.

Q Okay; can you name other known human carcinogens found in cigarette smoke?

A I've done this before for numerous depositions and testimony, but I'll try; okay?

So beryllium has been found in some tobacco samples from time to time. And that's a known human carcinogen.

Arsenic, cadmium; now, nickel has been found

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from time to time. And though nickel, if one doesn't scratch below the surface, if you will, it's really nickel carboneals, and no one's ever found them in tobacco smoke.

But I'm not going to really argue with that. So you can find nickel. It may be the wrong form of nickel.

Chromium is found in tobacco smoke. That's also a known human carcinogen. And, of course, there are different forms of chromium, and only one form is carcinogenic.

And since I don't believe anybody knows which form it is, I think it's reasonable to make the conservative assumption that it's the wrong -- it's the bad form.

So chromium is found in there; vinyl chloride, we've talked about. Benzene is specifically a known human tumogen, so it's a certain kind of carcinogen. And that's found in smoke.

2-naphtholomene [ph], 4-amino-biphenyl; there are probably some others, but that's probably the big list. And there are some that -- forgive me -- there are some that are on the cusp, like 1-3-butadiene, that in some people's minds is, in other people's minds isn't. And that's found in tobacco smoke;

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1-3-butadiene.

Q And who would make the determination that one of these items that may be on the cusp would get on the list?

A For Philip Morris?

Q Sure; for Philip Morris.

A Okay; if it's on the cusp, it's on the list. If it's an animal carcinogen, it's on the list, on Philip Morris' list for trying to eliminate or reduce.

Q All right; then the next part of this phrase was, "issues related to internal and independent assessment of the ingredients/additives used in the manufacture of cigarettes, including their purpose and chemical and physiological effect".

Now, have I read that correctly?

A Yes, sir.

Q And I think in discussions with you before, when you say ingredients slash additives, you're using those terms synonymously?

A Yes, sir.

Q Okay; what is the purpose of adding ingredients to tobacco in a cigarette?

A There are purposes.

Q Okay; what are they?

A They range from allowing you to end up with

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shreds of tobacco in the cigarette, rather than dust. And those --

Q Let's be -- I'm sorry.

A Those would be humectants. And the single largest by volume ingredient that Philip Morris adds is water.

But there are additional things that also fall into this category. But basically, they are there to maintain the pliability of the tobacco as it moves through the process of incorporation into the cigarette.

There are things called processing aids that are used during the process but are, in general, not found in the finished product.

So an example would be carbon dioxide, which is used by us in a process for puffing tobacco, like people puff wheat.

And so you end up with a form of tobacco that occupies a space, but weighs less. And there are a number of advantages to having such materials.

Then there are flavors. These are materials that are added to the tobacco, generally speaking, at very, very low levels.

And their purpose is to impart, in general, a unique subjective characteristic in the smoke to the smoker.

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Those are the kinds of things. There are casings. These are things like sugar, that are added to decrease the harshness of the tobacco

For certain kinds of tobacco, as a function of storage or aging, the sugars in the tobacco decreases.

And so they add back sugars to bring it back to levels similar but not necessarily identical to what they were before.

But in general, they are added to decrease the harshness of the smoke.

Q Would tobacco itself, without any flavorings added, would it have a particular taste?

A Since there are different types of tobaccos, and I have smoked different types of tobaccos, I can tell you they have some very unique characteristics; yes.

You could, never having done this before, tell that -- by smoking it, know that there are unique characteristics to the different kinds of tobacco.

Q Are there any cigarettes, to your knowledge, that are marketed which have no flavorings added to the tobacco?

A I'm aware of a couple of products that claim to have no additives. There are at least two that come

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to my mind.

Whether they are still that way or not, I don't know. But I can think of, just very quickly, two, two products.

Q And what are they?

A One is a Reynolds product. And I think the advertisement says "no bull". And the other is something -- and I may not have this precisely correct -- Spirit or Free Spirit, which is touted as a back to nature, maybe Native American.

Whether it actually is or not, I don't know. But that was my understanding of what some of the advertising was --

Q Has Philip Morris ever sought to market a cigarette with no flavoring added to the tobacco?

MR. KLEIN: Objection to the word "ever".

THE WITNESS: I can't answer that question. I don't know about ever.

BY MR. EVANS:

Q Okay; in your time at Philip Morris, did Philip Morris ever market a cigarette with no flavoring added to the tobacco?

A Just thinking about the United States, I would say I believe that's correct. I can't speak for

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what was going on in every corner of the Philip Morris world outside the United States.

Q In your opinion, would a cigarette which had no flavoring added to the tobacco -- would it pose any different health risks to the smoker than one which has flavorings added to the tobacco?

A It might.

Q It might?

A Yeah.

Q And the reason that it might, is that because there may be health effects based on the flavorings that are added to tobacco?

A Oh, actually, I was thinking just the opposite.

Q Okay.

A Okay; generally speaking, when you put ingredients or additives in, you do it at the expense of tobacco.

So you're taking out tobacco.

Q You're talking about volume?

A Weight.

Q Weight.

A Weight; and as far as I'm concerned, and some other people, both -- not just inside the company, but outside the company, one of the objectives is, to

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make a less riskier product, is to use less tobacco.

Another reason -- so it could very well be, depending upon the weight of tobacco in the product -- the more tobacco, based on everything -- all the knowledge I have, I would say that you're possibly increasing your risk for certain kinds of diseases.

So to that extent, ingredients and additives would be -- would at least not be increasing it. And I think Dr. Sullivan, when he was Secretary of H.H.S. basically, when asked about additives/ingredients, he said, "Please, the issue is tobacco."

And I think that's -- that's where, at least, I've been focusing and where Philip Morris has been focusing.

Not to say we've ignored evaluation of additives and ingredients. We haven't. But if you want to know where you really need to focus, it's on the tobacco side.

Q In Philip Morris' products, is there a range of the ratio between the weight of the tobacco and the weight of flavoring additives?

A Sure, yes.

Q Okay; what Philip Morris cigarette has the least tobacco, in terms of weight?

A The Super Slims.

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Q The Virginia Slims Super Slims?

A Yes, sir.

Q And do you know approximately what that ratio is, what of the weight is tobacco?

A I can't recall, as we sit here, the answer to that specific question.

Q Okay; is it -- are we talking about in the range of fifty percent tobacco and fifty percent other things, or --

A Oh, no, no, no, no; if you look at a standard cigarette, you might see seven hundred or so milligrams of tobacco.

And what I'm saying, with Virginia Slims you have a much smaller weight of tobacco.

Q How much smaller? And I'm not looking for an exact answer.

A I don't know. But it's significant. Okay; we're not talking here -- ten percent. We're talking a lot less tobacco.

And, for instance, in the Merit Ultima -- and again, I think it's also significantly less -- there is a significant amount of puffed tobacco in there that allows it to -- it's one of the design elements that allows it to achieve its tar delivery.

So there might be thirty percent less

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tobacco in a Merit Ultima. Now, those are numbers I remember. Whether they are precise and accurate today as I speak, I don't know.

But those are the numbers that -- or the ranges that I remember.

MR. EVANS: Okay, all right; we've been going about an hour and a half. Why don't we take a five minute break?

(Brief recess.)

BY MR. EVANS:

Q Okay; Dr. Carchman, we're back from a break, and I'm about to finish up with this list of areas that you may offer expert testimony in.

And the last one I want to talk about says, "Philip Morris' efforts to cooperate with and respond to certain governmental entities and public health organizations regarding cigarette design issues".

And have I read that correctly?

A Yes.

Q Okay; is it your opinion that Philip Morris has been cooperative with governmental entities and public health organizations regarding cigarette design issues?

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A As far as I'm concerned, they continue to be; yes.

Q Okay; what public health organizations in particular would you give as examples of Philip Morris' cooperation?

A I've given some of them in some of my earlier answers. From the Massachusetts Department of Health to the Federal Canadian Health to the Institute of Medicine, which is part of the National Academy of Sciences, which was charged by the U.S. Food and Drug Administration to look into certain aspects of tobacco. Those are some of the most recent examples here in the United States -- in North America; sorry.

Q North America.

And what about an international organization like the World Health Organization?

A Yes; Dr. Solana has been in communication with World Health Organization, at least Dr. Yach, in terms of offering up information that we might have.

Philip Morris scientists have made presentations in the United Kingdom, to their version of the Department of Health, to the E.U., on their health sides.

And those would be what I would call governmental, or in the case of W.H.O. since it's not a

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governmental, a non-governmental but public health organization.

There have also been individual interactions between Philip Morris scientists and outside scientists that I would call public health scientists.

Q Okay; in your opinion, does Philip Morris have any responsibility to cooperate with public health authorities?

MR. KLEIN: Objection.

THE WITNESS: In my opinion, they do.

BY MR. EVANS:

Q In your opinion, does Philip Morris have a responsibility to communicate to the public at large about its products?

MR. KLEIN: Objection.

THE WITNESS: To the extent that those communications do not undermine the public health messages, they might.

BY MR. EVANS:

Q Do you know if Philip Morris has ever undertaken any efforts to inform the public about ingredients in its tobacco -- in cigarettes?

A I believe, in April of 1994, Philip Morris

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provided information to the public as to both the quality and quantity of the industry -- U.S. ingredients of the major, who at that time was I think six companies -- of the list that was provided to Health and Human Services, the Office of Smoking and Health, that represented the 1993 list.

And I think they also made available a 1994 assessment by several prominent scientists outside the industry.

And I think that `94 risk assessment or health assessment document is included in my reliance; so, yes.

I mean, I can think of one example, at least. And the one that you raised is the one that sort of jumps out at me at this point.

Q Okay; can you think of an example of -- prior to 1994, of Philip Morris giving information to the public about its cigarette ingredients?

MR. KLEIN: By public, do you include public health authorities or --

MR. EVANS: Yes; I'll include public health authorities.

THE WITNESS: Okay; there had been in U.S. Surgeon General's reports and in publications about how important ingredients are in the manufacture of

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cigarettes as you were moving to lower tar.

And I guess Professor Wynder, the late Professor Wynder, espoused this on numerous -- from the American Health Foundation, espoused this on numerous occasions.

And it was talked about in at least one, maybe more, U.S. Surgeon General's reports as being important.

And let me see if I can paraphrase Dr. Wynder. He said of what value is putting a safer cigarette on the market, if nobody will smoke it.

And so there was encouragement for the use of ingredients that would allow smokers to take advantage of any reduced risk that might be associated with such a product consistent with some very longstanding scientific and medical arguments that people like Professor Wynder made for many decades.

BY MR. EVANS:

Q Again pre-1994, was there any instance of Philip Morris providing information on what the ingredients were in cigarettes?

A On a yearly basis since 1986, Philip Morris,

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as part of a U.S. industry legal requirement, provided information to the Office of Smoking and Health, through the law firm of Covington & Burling, which assembled the industry list into an aggregate list, in compliance with that regulation or law, whatever level that -- however you lawyers would describe that.

Q Do you have any knowledge of information on what the ingredients in cigarettes provided by Philip Morris prior to 1984, I believe you said?

A Do I have knowledge?

Q Yes.

A Yes; I have some knowledge of what those ingredients were prior to 1984.

Q Well, no; you may have misunderstood my question. Knowledge prior to 1984 of Philip Morris revealing the list of ingredients, revealing what ingredients were in cigarettes.

A Some of them; yes. Revealing is sort of an interesting word. There are processing patents that Philip Morris issued.

And those patents included the use of agents to make -- that participated in the creation of some of those products that were incorporated into the product.

So, for example, in some of the sheet or reconstituted material, you could see in the patents

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what it was Philip Morris was using, for example.

And patent information, as far as I know, is -- once it's issued, is publicly available information.

Q Philip Morris lists ingredients in its cigarettes on its web site currently; isn't that correct?

A Philip Morris has information on the web site in relationship to the ingredients.

Q Okay; well, to your --

A It does not list the ingredients in the product, other than in a manner consistent with the way ingredients are listed on this Diet Coke can.

So it lists some specific materials, and then has a -- my recollection is it also has a general capturing for flavors.

For example, except for menthol in a mentholated cigarette, it's not going to tell you what those specific flavors would be.

Q Did you have any involvement in the information that's on the web site regarding ingredients?

A Regarding ingredients; no.

Q Okay; to your knowledge, can you look up a particular brand of Philip Morris and get information on

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the ingredients from the web site?

A Yes; as I have described the ingredient information and how it's provided. So you would see, "natural and artificial flavors".

But it won't tell you what those specific flavors, natural or artificial, were. At least that's my recollection of what I saw. Things may have changed since the last time I looked at it.

Q But as far as you know, I couldn't go the web site and get the recipe for a Marlboro?

A I believe that's correct.

Q Is the information provided on the web site -- is that mandated by the Federal Government?

MR. KLEIN: Objection.

You can answer.

THE WITNESS: I don't think so, but I don't know.

BY MR. EVANS:

Q You don't know; okay.

I know you have worked in international matters for Philip Morris. Do you know if there are differences in different countries as to what governments require in terms of listing of ingredients?

A I do know, and there are.

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Q Okay; are there countries that require more disclosure or more detailed disclosure of ingredients than does the United States?

MR. KLEIN: Objection.

You can answer, if you know.

THE WITNESS: If you say disclosure, you mean public disclosure?

BY MR. EVANS:

Q I do.

A Then I --

MR. KLEIN: Wait; hold on for a second.

THE WITNESS: Excuse me.

MR. KLEIN: Let me interrupt, because I'm confused.

When you use the word public, are you talking about disclosure to a governmental entity, or are you talking about requiring some public web site disclosure?

MR. EVANS: Okay; well, I appreciate that distinction. Let's break it down. Let's talk about disclosure to a government or to a government entity.

MR. KLEIN: And the question is, again?

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BY MR. EVANS:

Q Are there countries that require more detailed disclosure to a government entity than does the United States require?

A I believe the answer is yes.

Q Okay; what's an example of a country that has a more detailed requirement?

A Australia or New Zealand.

Q Do you know whether what Philip Morris has on its public web site would satisfy the disclosure requirements of a country like Australia or New Zealand?

MR. KLEIN: Objection.

You can answer, if you know.

THE WITNESS: I don't know the answer to that.

BY MR. EVANS:

Q Okay; do you know if Philip Morris has on its public web site more information than it is required to under United States laws?

MR. KLEIN: Objection; are you suggesting by your question that the United States laws require disclosure on a web site?

MR. EVANS: No, I'm not. I didn't mean to

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suggest that.

THE WITNESS: That sounds like it requires a legal --

BY MR. EVANS:

Q Okay.

A I don't know the answer to that question.

Q And is it safe to say then that you won't be offering any opinions on the legal requirements of disclosing ingredients in your testimony?

A I believe that's true.

MR. KLEIN: Other than what he's testified to here today already.

MR. EVANS: I understand.

BY MR. EVANS:

Q Dr. Carchman, do you have any knowledge at all of the named Plaintiffs in this case, Krista Blankenship or Mae Sebo [ph]?

A Repeat the question, please.

Q Do you have any knowledge at all of the named Plaintiffs in this lawsuit, who are Krista Blankenship and Mae Sebo?

A My only knowledge is having seen their name on the Complaint.

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Q Okay; have you ever lived in West Virginia?
A No.
Q Do you have relatives in West Virginia?
A Not that I know of.
Q Okay; and have you had any occasion to spend any substantial amount of time in the State of West Virginia?
A Yes.
Q Okay; what was that?
A Camping, fishing, and going to some of the hotels on the West Virginia side of the Virginia/West Virginia border.
Q Any experience at all with the health care system in the State of West Virginia?
A No, sir.
Q Okay; do you expect to give any testimony at all regarding the health care service or delivery of health services in the State of West Virginia?
A No.
Q When you were an employee of Philip Morris, did Philip Morris provide health care benefits?
A Yes.
Q Okay; did that include any coverage for medical screening?
MR. KLEIN: Objection.

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THE WITNESS: If that's what the -- your physician wanted, I would assume there might be. But I have no firsthand knowledge of that.

BY MR. EVANS:

Q Okay.

A Other than to say, when my personal physician said, "You need this test.", I had a conversation with her about why, and then I did it, and the company's insurance plan paid for it.

Q Okay; are you familiar with the medical monitoring proposals that have been offered by Plaintiffs' experts in this case?

A I answered an earlier question, have I read any of the Plaintiffs' experts reports. And I haven't, so I can't -- I don't know what they said, so I can't answer your specific question.

Q Well, I think you answered it, but I'm not sure. I realize you haven't read any of their reports.

But do you have any familiarity with the medical monitoring proposals that have been proposed by Plaintiffs' experts?

A I have a -- I'd say I have a sense from the Complaint document.

Q Okay.

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A And that's what I was responding to earlier. But I have not seen any of the experts that support that, any of their reports that support that.

So I only have a general sense of what it is they're looking for.

Q Okay; then I take it you will not be offering any testimony regarding the specific medical monitoring proposals offered by the Plaintiffs' experts in this case?

A Not as an expert.

Q Okay; you have testified in recent depositions and trial testimony about some new research areas that Philip Morris has been involved with. And I'd like to follow up on a couple of those, and see if you can give me any more information.

One is called the total exposure product, which is part of a public submission to the Institute of Medicine.

Can you describe for me the current status of this total exposure project, to the extent you know?

A Okay; first, Mr. Klein has, I think, provided you with a packet of documents which is precisely what we have presented and submitted to the Institute of Medicine regarding this.

So it has all of the details, very specific

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details in that.

MR. KLEIN: Well, let me interrupt you. Because I haven't provided it to him yet.

THE WITNESS: Oh.

MR. KLEIN: But this morning, when I indicated that there was an addition to the reliance list, one of the two things that I mentioned were the submissions to the National Institute of --

THE WITNESS: No; the Institute of Medicine.

MR. KLEIN: -- National Institute of Medicine.

And here, I am providing you with now, are the materials.

MR. EVANS: Thank you very much.

THE WITNESS: Having said that, the answer to your question is yes, we have identified and are moving forward with a pilot phase, and it's called the total exposure study, not the total exposure product.

And if I had the word product in there, then I mis-spoke. It's total exposure study.

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BY MR. EVANS:

Q I believe I called it project.

A Oh, project.

Q But total exposure study; that's fine.

A Okay; and so we have a contract with a contract research organization. And they are basically starting in the pilot phase of this study.

Q Another program that you described as a fairly recent and active program is called the SCRP, the smoke constituent reduction program.

Can you just briefly describe for me what that is, and if that is, in fact, an ongoing program?

A Yes; it is ongoing, and it consumes probably the most significant part of the research, development, and engineering budget and resources.

But I must tell you that I need to speak to my counsel. Because there are, I believe, some significant proprietary information.

If I were to go into any details with you, I would need to be assured --

MR. KLEIN: Well, he hasn't asked you for the details yet, so let's --

THE WITNESS: Okay.

MR. KLEIN: He's asked you if it's ongoing. You've said it's ongoing. Now you've answered that

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question. Let's see what the next question is.

BY MR. EVANS:

Q No; I'm not after any proprietary information. And I assume you would not be testifying to any proprietary information; is that correct?

A That's correct.

Q Has any -- and I realize this is a somewhat broad question.

MR. KLEIN: I object to it.

BY MR. EVANS:

Q But can you give me an example of any aspect of the smoke constituent reduction program that has resulted in a change implemented in one of Philip Morris' cigarettes?

A I'm not sure I can, without crossing the proprietary line here.

MR. EVANS: Oh, okay; I'm going to request another really short break, because I want to look at this document that you've just handed me.

I will also tell you that I don't think I have very much more, and I think we'll be through shortly.

But I do need another quick break.

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(Brief recess.)

(Deposition Exhibit No. 4 was marked.)

BY MR. EVANS:

Q Dr. Carchman, what is the tar delivery of the Accord cigarette?

A The Accord cigarette that's in test market today in Richmond, I believe, is two milligrams, two to three milligrams of tar.

Q And are there plans to modify that and raise the tar delivery of the Accord cigarette?

MR. KLEIN: I have to -- I'm going to have to instruct the witness not to answer that question on the basis that it may involve proprietary material, as to -- and information as to the plans of product development on that product.

(Whereupon, the deposition proceeded in confidential session.)

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(Page withheld, submitted under seal.)

(Whereupon, the deposition proceeded in open session.)

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BY MR. EVANS:

Q All right; Dr. Carchman, you have previously testified in your deposition in the Labelle case, in talking about the Accord cigarette, you said, "The current Accord that's in test market, I think, is a three milligram tar product. They are coming out with a modification to bring it up to six milligrams, because the consumer evaluation says it just doesn't have the taste."

To your knowledge, are there still plans to carry out that modification of the Accord cigarette?

A The answer is two-fold. Yes, I said that. Two; I thought that somebody -- one of the lawyers was trying to somehow protect that.

But obviously -- obviously not.

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MR. KLEIN: That information is not subject to a Protective Order, counsel?

MR. EVANS: No; not to my knowledge.

MR. GADDES: I think the Labelle transcript is. I don't know if that portion of it is or not, but I think it is.

My suggestion, with that being the case, is that we would have to stipulate that this portion of the deposition is also subject to whatever Protective Order the Labelle transcript is.

MR. EVANS: Well, okay; I will not pursue this line of questioning. And I understand your objection to his answering.

Thus far, I have only read from the transcript of the Labelle deposition, which it's my understanding is not under any sort of seal.

If I learn that that is not the case, I certainly do not object to a similar arrangement. But as I said, it is not my understanding that this was under seal.

MR. KLEIN: Okay.

MR. GADDES: To the extent that the portion of the Labelle transcript you have read is governed by a Protective Order, then we can stipulate that the same procedures will apply to what we read into

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this case.

MR. EVANS: Well, I don't want to say the same procedures, without having seen any such procedures.

MR. KLEIN: Well, that's my point. If we're going to get into this in any detail -- I don't know how far you wish to go on the Accord or what its relevance is.

Obviously, if you've got a transcript where he's answered a question about -- that you just read to him, that's not under seal, and I don't know that it is or it isn't.

If it's not, I guess there's nothing I can do about it. But further questions, I can, I think, object to and must object to.

And must instruct the witness not to answer, unless we place this deposition under a Protective Order and seal in which we enter into in this case, irrespective of whatever happened in Labelle.

MR. EVANS: Okay; I am not going to pursue any more questions on this topic. And therefore, I would see no reason to put anything in this proceeding under seal, unless I discover that there was some protection that I didn't know about in the Labelle case, at which case we can address that at

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that time.

BY MR. EVANS:

Q The last thing I want to ask you about, Dr. Carchman, in terms of -- oh, excuse me. I earlier, in the break, I had the Court Reporter mark as exhibit number four a document which I'll show you now.

(Mr. Evans handed a document to the witness for his examination.)

And let me tell you that this document is included on your list of reliance materials. And let me ask you if this is a document you recognize.

A Yes.

Q Okay; for the record, this is a Philip Morris Inter-Office Correspondence from Dr. K.S. Houghton -- excuse me; to Dr. K.S. Houghton from J.L. Charles.

And the subject is Termination of the PMT Project. And it's dated August 3rd, 1992.

Can you tell me, Dr. Carchman, what in particular in this document makes it a document you have on your reliance list?

A In part, this has to do with the nature of Philip Morris research. And this project was a unique project. And it was one that achieved its goals.

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And basically, they were -- Dr. Charles was recommending to Dr. Houghton some actions to take regarding this.

And so, let me -- and there were patents issued as a result of this. And the continuation of this work was transferred to a plant molecular biologist at the University of Virginia, Dr. Temko [ph].

So this was work that was initiated by Philip Morris, within Philip Morris. It achieved some of the key objectives, and the patents were put together, eventually issued.

And Jim was telling Dr. Houghton that this work will be completed, and the date here is the end of December of 92.

Q Okay; if you'll look at the third paragraph, the first couple of sentences, it says, "We realized early on that a successful biotechnology altered tobacco plant could not be introduced into commerce by PM. Instead, we envisioned that at some point we would have to transfer the technology to a land grant university for implementation."

My question to you is, what is your understanding of what the author of this document means by implementation?

How was this technology going to be

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implemented?

MR. KLEIN: Objection to the form of the question.

THE WITNESS: Okay; I'm very much aware -- in fact, my name, as you know, appears in this other paragraph.

BY MR. EVANS:

Q Yes.

A I was the person responsible for this program, as the manager of this division. And I was also aware of all of the issues of dealing with genetically modified whatever.

And that's what Dr. Charles was talking about. That for Philip Morris to implement a genetically modified product into the marketplace would probably not be successful.

And the way to do this, if it was possible, would be to go through one of the land grand universities, and that would include North Carolina State University or the University of Kentucky, for example, that have large programs looking at tobacco, tobacco seed, tobacco modification.

And basically give it to them, give them this technology, and see if through them we could

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implement it.

But even with that, I think that there was still some concern, which I think just opening up any paper, any day, you can see what the dickens is going on with Taco Bell and genetically modified corn being found.

It's a politically charged, controversial area. And Jim was telling Ken in this sentence he didn't think that we could do it ourselves.

If it could be done, this potentially was a way to do it.

Q Okay; when it says, "a successful biotechnology altered tobacco plant could not be introduced into commerce by PM", is it your understanding that that is talking about introducing the tobacco plant and not a cigarette using that altered tobacco?

A I don't make a distinction. If we had been able to implement this and feel comfortable about some of the safety aspects of this, it could have ended up in a commercial product.

Q Okay; now, do you have knowledge of the progress that was made, if any, after this was transferred to a land grant university?

A Yes; I mean, it's still -- the work is still

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going on. And there has been what I would call, in my mind, satisfactory progress in terms of continuing the work that we initiated in this area.

Q Have any of the results from the PMT project been implemented into commercial products at Philip Morris?

A This is transgenic work. And as was true in this memo from Dr. Charles to Dr. Houghton, it's even more true today.

We have not -- nor would we in the current environment implement this.

Q And let me direct your attention to the last sentence of the second paragraph. It says, "The bottom line is that our substantial progress over the past several years has not been sufficient to address the question of whether nicotine is or is not a direct precursor of NNK."

Has progress been made since this 1992 memo to address the question of whether nicotine is or is not a direct precursor of NNK?

A Both by us and others. And the answer is yes.

Q Okay; the answer is yes, that progress has been made.

Is nicotine a direct precursor of NNK?

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A Yes.

Q Does Philip Morris share the results of its research on smoking and health with its competitors?

A Anything that it would share with its competitors would be done in a public way. So if they happen to be present, yes, it would be shared with them.

But it would be, for example, at a Society of Toxicology meeting, or the Institute of Medicine is on the I.O.M.'s web site for anybody to pick up, including our competitors.

So that's the extent to which that kind of stuff goes on, that I'm aware of today.

Q Okay; are Philip Morris cigarettes any less hazardous than the cigarettes of its competitors?

A I don't know how you would answer that question. It goes back to another question, related question you asked me before.

Dr. Kyler Hammond [ph], when he was a major scientist with the American Cancer Society, I think was asked that question in a Congressional hearing.

And he said, yes, he believes there are less riskier products out there. He just doesn't know which ones.

And part of what we're trying to do with the Institute of Medicine, with the Commonwealth of

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Massachusetts, with the E.U. and the W.H.O., is to try to set in motion some methodologies that would help everyone, both the public health people and Philip Morris in this particular case, figure that out.

And if we could get a handle on it, that would enhance our ability to redesign or further design the product to achieve -- to be able to answer your question.

MR. EVANS: Just give me a second to look at my notes. I think I'm about finished.

(Pause.)

Dr. Carchman, I don't have any other questions. I thank you for your time.

MR. KLEIN: Thank you; no questions here at the deposition site by counsel for Philip Morris.

Anybody on the phone have any questions? Is anybody still on the phone?

MS. KANDZARI: We're here; my only question is about getting a transcript. I just need to talk to the Court Reporter about that.

MR. KLEIN: All right; well, we're now with that going to adjourn the deposition. We're going to go off the record. We'll keep the phone line open for conversations with the Court Reporter. Thank you all very much.

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(Discussion off the record.)

(Deposition concluded, 12:40 p.m.)

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COMMONWEALTH OF VIRGINIA, AT LARGE, to-wit:

I, Kurt D. Hruneni, a Certified Verbatim Reporter and a Notary Public in and for the Commonwealth of Virginia at Large, and whose commission expires on February 2, 2002, do certify that the aforementioned appeared before me, was sworn by me, and was thereupon examined by counsel; and that the foregoing is a true, correct, and full transcript of the testimony adduced.

I further certify that I am neither related to nor associated with any counsel or party to this proceeding, nor otherwise interested in the event thereof.

Given under my hand and Notarial seal at Midlothian, Chesterfield County, Virginia, this 24th day of October, 2000.

Kurt D Hruneni

Kurt D. Hruneni, C.V.R., Notary Public
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CURRICULUM VITAE

RICHARD ALLAN CARCHMAN

PERSONAL INFORMATION:

BIRTHDATE:	[DELETED] 1943	HOME ADDRESS:
BIRTHPLACE:	Queens, New York	[DELETED]
CITIZENSHIP:	United States	
SOC. SEC. NO.:	[DELETED]	
MARITAL STATUS:	Married	OFFICE ADDRESS:
WIFE:	Susan M.D., Ph.D., J.D. (Dec. '94)	Philip Morris U.S.A.
CHILDREN:	Evie (born 1979)	Research and Development
	Megan (born 1981)	P.O. Box 26583
		Richmond, Virginia 23261
		PHONE: (804) 274-5794

EDUCATION:

DEGREE	DATE	MAJOR	SCHOOL
Postdoctoral	5/74	Molecular Biology	Natl. Inst. of Health (Dr. I. Pastan)
Ph.D.	6/72	Pharmacology	SUNY Downstate Med Ctr. (Dr. R. Rubin)
B.S.	6/66	Biology/Chemistry	Long Island University

HONORS:

Research Career Development Award (NIH), (1979-1984)
NIH Postdoctoral Fellowship
U. S. Environmental Protection Agency Award
NIH Predoctoral Fellowship

POSITIONS HELD:

INSTITUTION	DEPARTMENT	RANK	DATES
Philip Morris USA	Research, Development & Engineering	Retired Vice President	2/1/99
Philip Morris USA	Research, Development & Engineering	V.P. RD&E	9/98-2/99
Philip Morris USA	Worldwide Scientific Affairs	V.P. Worldwide Sci. Affairs	12/97-8/98
Philip Morris USA	Research and Development	V.P. Sci. Affairs	11/96-11/97
Philip Morris USA	Research and Development	Group Director Sci. Affairs	9/96-10/96
Philip Morris USA	Research and Development	Director Sci. Affairs	10/92 - 8/96
Philip Morris USA	Research and Development	Manager	2/91 -9/92
Philip Morris USA	Research and Development	Principal Scientist	12/88 -2/91
MCV/VCU	Pharmacology/Toxicology	Affiliate Professor	12/88
	Biostatistics	Affiliate Professor	12/88
MCV/VCU	Massey Cancer Center	Associate Director	10/88 - 12/88
MCV/VCU	Pharmacology/Toxicology	Professor	7/86 - 12/88
MCV/VCU	Massey Cancer Center	Assoc. Scien. Dir.	11/86 - 10/88
MCV/VCU	Pharmacology/Toxicology	Associate Professor	7/81 - 6/86
MCV/VCU	Biostatistics(joint appointment)		2/85 -
MCV/VCU	Biology (joint appointment)		9/83 -
MCV/VCU	Pharmacology/Toxicology	Assistant Professor	5/74 - 6/81
NIH, NCI	Lab Molecular Biology	Postdoctoral Fellow	9/72 - 5/74
SUNY, Downstate	Pharmacology	NIH Predoct. Fellow	9/68 - 8/72
Columbia Univ.	Inst. for Cancer Res.	Tech. Res. Assistant	9/64 - 8/68

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MEMBERSHIPS - SCIENTIFIC, HONORARY AND PROFESSIONAL SOCIETIES:

American Society of Pharmacology and Experimental Therapeutics
Reticulendothelial Society
American College of Toxicology
International Union of Pharmacology, Toxicology Section
New York Academy of Sciences
Southeastern Regional Cancer Researchers
Drug Information Association
Sigma Xi
Society of Toxicology
American Association for Cancer Research
Center for Innovative Technology, Industrial Advisory Board, State of VA
State Council for Higher Education, Industrial member for Selecting Outstanding Teacher/Professor , State of VA

PROFESSIONAL ACTIVITIES:

NATIONAL/INTERNATIONAL:

Scientific Submissions to: US OSHA-1996, CalEPA-1997, National Toxicology Program-1998 (also presented to National Toxicology Program committee)
National Academy of Science/National Research Council Committee - 1998
Chairman, Board of Directors, Center for Indoor Air Research - 1998
Health Canada Expert Panel - 1998
National Institute of Environmental Health Sciences Training Grant (MCV/VCU) - 1998

Editorial and Journal Reviewer

Reviewer for Journal of Immunology
Reviewer for the Journal of Leukocyte Biology
Reviewer for the Journal of Pharmacology and Experimental Therapeutics
Reviewer for the American Society of Pharmacology and Toxicology
Reviewer for Cancer Research
Reviewer for Biochemistry
Reviewer for Biochemical Biophysic ACTA
Editorial Advisory Board for Advances in Modern Environmental Toxicology
Editorial Board, Toxicology and Industrial Hygiene

Review Committees

Reviewer for Research Proposals for the Alberta Heritage Foundation for Medical Research
Expert Panel for PHS/HHS, Center for Disease Control
Environmental Health and Injury Control Scientific Advisor to the Virginia Environmental Endowment Foundation
Reviewer for Research Proposals for the Center for Alternative Animal Research, Johns Hopkins University
NIAID Special Review on Cytomegalovirus National Institute on Drug Abuse Special Review Committee (AIDS)

Meetings

Co-Chairman, 1988 FASEB meetings, Las Vegas, Nevada
Chairman, "Design, Implementation and Analysis of Drug Interaction Studies," 1987 ASPET meetings, Honolulu, Hawaii
Chairman, Virginia Institute of Marine Science (VIMS)/Massey Cancer Center Symposium on Immunology/Toxicology/Cancer, Richmond, Virginia (1986)
Co-Chairman, Target Organ Toxicity (Endocrine), National Toxicology Program (1984) International Union of Pharmacology (IUPHAR), Section in Toxicology Program Committee, American College of Toxicology

University Committees:

MCV/VCU Cancer Center Member Reticuloendothelial System - Medical School
Recombinant DNA Committee
Dental Research Committee
Grievance Committee
Cancer Research Planning and Development Committee, Massey Cancer Center
Director - Leukocyte Cell Biology Program, Massey Cancer Center
Committee on Committees

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Associate Scientific Director, Massey Cancer Center
Member, AIDS Symposium Conference Planning Committee
Admissions Committee
Advisor to first year students
Alternative Language Requirement Committee
Chairman, Comprehensive Exam Committee
Chairman, Promotion Committee for Dr. B. R. Martin (School of Basic Health Sciences, 1987)
Member, Promotion & Tenure Committee for Dr. F. Cabral (School of Basic Health Sciences, 1987)
Member, Promotion & Tenure Committee for Dr. D. Gewirtz (School of Basic Health Sciences, 1987)
Member, Promotion & Tenure Committee for Dr. C. Gennings (School of Basic Health Sciences, 1988)
Member, Promotion Committee for Dr. S. Yanovich (School of Medicine, 1988)
Member, Promotion & Tenure Committee for Dr. L. Kaplowitz (School of Medicine, 1988)
Member, Promotion Committee for Dr. M. Kalimi (School of Health Sciences, 1988)
Chairman of Grievance Committee, School of Basic Health Science on Dr. Hsu and Dr. Macrina (1988)
Four year I & I Committee
Member Promotion Tenure Committee for Dr. K. L. White, Jr. (School of Basic Health Sciences), 1990.

GRADUATE STUDENTS TRAINED:

Predoctorals:
Estelle Goodell (Assistant Professor Basset/Columbia University)
Debra Laskin (Associate Professor, Rutgers University)
Bernard Debski (Chairman, Dept. of Periodontics, Univ. of Detroit)
James Charles (Vice President of Research, Philip Morris, USA)
Bonita Smith (NIH)
Barbara Kelly (Postdoctoral, MCV)
James Gaut (Postdoctoral Univ. of Rochester, N.Y.)
Dr. Richard Solana (Lieutenant Colonel, USAMRC, ICD, MD)
Karen Iorio (Postdoctoral, ADAMA)
Michael Shakarjian (Bristol Myers Squibb)
Dr. Ellen Byrne (Ass't Professor, School of Dentistry)
Todd O'Hara (Research Veternarian)
Debbie Koller
Gerry Nixon
Stephanie Meadows
Van Nguyen

Co-Advisor:
David End (Pharmacologist - McNeil Laboratory)
Edward Carmines (Corporate Toxicologist, Hoechst-Roussel Pharmac.)
Richard Lane (VP, Lipton)

Predoctoral Committees:
Has been or is a member of 50 Ph.D. faculty advisory committees in the Departments of Pharmacology/Toxicology, Biochemistry, Physiology/Biophysics, Anatomy, Microbiology/Immunology and Biostatistics.

Postdoctorals:
William Warner (Associate Professor, NYU)
David Seyler (Assistant Professor, Columbia Hospital, Georgetown Univ.)
Joseph Montes (Institute for Chemical Defense, MD)
Colette F. Strnad (Canada - Health & Safety)

Master of Science:
Jennifer Horn (M.S.)
Charu Krishnamuvthy (M.S.)
Maria Shulletta (M.S.)
Cindy Boswell (M.S.)

Brown & Williamson Tobacco Corporation

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Research Associates:
Paul Klykken (Assistant Professor, University of Mississippi)
Robert Sturm (Scientist, Ayerst Research Lab., NJ)
Carl McCrady, Assistant Professor MCV
Caroline Kramer, Assistant Professor MCV)

Research Assistant:
Fay Kessler

Scientists:
Dr. Paul Baron (Sloan Kettering, Surgical Oncology)
Dr. A. A. Fowler, III (Pulmonary Medicine, MCV)
Dr. Cecile Rose (Pulmonary & Environmental Medicine, Col.)
Dr. Scott Woogen (Gastroenterology, MCV)
Dr. Gita Massey (Pediatrics, Oncology, MCV)
Dr. Li Fei (P.R. of China)
Dr. Toncred Styblo (Surgical Oncology, MCV)
Dr. Zhi Gong Lin (P.R. of China)

ACTIVITIES - July-December 1988:

Teaching:
MI - Cell Biology of AIDS - 1 hour
MII - Antimicrobials and Antiparasites - 7 hours
General Princ. Tox. Mutagen/Carcin. - 4 hours
Biochemical Pharm. - Prot. Kinases - 1 1/2 hours
Microbial Biotechnology/Microbiology 691 - 3 hours

Reviewed - Scientific Reports:
Health Assessment Documents for EPA - Phtalate Esters
ATSDR/CDC - 1,2-dichloropropane
Health Canada - Development of Potentially Less Hazardous Cigarette - 1998

Edited - Journal of the American College of Toxicology (Vol. 7, No. 7, 1988):

Berenbaum, M.C.: Isobolographic, Algebraic, and Search Methods in the Analysis of Multiagent Synergy, pp. 17-28.

Staniswalis, J.G., and McCrady, C.W.: The Use of Kernel Estimators in Describing Human T Lymphocyte Proliferation Induced by Phorbol Esters and Ca Ionophore, pp. 29-41.

Wessinger, W.C., and Evans, E.B.: Modeling Multiple Agent Interactions in Behavioral Pharmacology, pp. 43-52.

Carter, W.H., Jr., Gennings, C., Staniswalis, J.G., Campbell, E.D., and White, K.L., Jr.: A Statistical Approach to the Construction and Analysis of Isobolograms, pp. 53-63.

Solana, R.P., Carter, W.H., Jr., Wilson, J.D., Chinchilli, V.M., and Carchman, R.A.: Qualitative Evaluation of Sister Chromatid Exchanges Elicited by Combinations of Genotoxic Compounds Using Response Surface Methodology, pp. 65-76.

Gessner, P.K.: A Straightforward Method for the Study of Drug Interactions: An Isobolographic Analysis Primer, pp. 77-102.

Gennings, C., Carchman, R.A., Carter, W.H., Jr., Campbell, E.D., Boyle, R.M., Staniswalis, J.G., Jones, D.E., Reid, F.M., and Koplovitz, I.: Assessing Physostigmine Efficacy by Response Surface Modeling: A Comparison to Pyridostigmine Efficacy, pp. 103-120.

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Graduate School: Lectures

Biochemical Pharmacology
Nurse Anesthetist
Microbial Biotechnology
General Pharmacology - Chemotherapy
Director - Advanced Toxicology
Co-Director - Environmental Toxicology
Advanced Cardiovascular
Biology of Cancer
Tumor Immunology
Tutorial
Principles of Toxicology
Biotechnology

Medical School: Lectures

Insulin
Antibiotics
Review for 4th Year - Medical Students - Chemotherapy
Review for Residents and Interns

RESEARCH SUPPORT:

Advisor, "Modulation of Growth and Function in Childhood Acute Lymphocytic Leukemia Cells by Interleukin-2 and Manipulation of Protein Kinase C and Calcium Homeostasis," American Cancer Society Clinical Oncology Career, Development Award, Years - 3-, $90,000 (Dr. G. Massey, PI).

Principal Investigator, American Cancer Society, Institutional Grant, 1988-1991, $30,000/yr.

Principal Investigator, "Models of Pulmonary Edema," Dept. Army, 1988-1991, $1,300,000.

Principal Investigator, "Exploration of T Lymphocytes Expandability in AIDS," NIH, 1987-1990, $465,000

Principal Investigator, Travel Funds for Symposium in Honolulu, Hawaii, D.O.D., ($11,599) August, 1987.

Principal Investigator, "Application of Response Surface Methodologies for Determining Optimum Treatment Strategies for Nerve Threat Agents," U.S. Army, 1986-1990 ($1,100,000).

Advisor, "Biochemical Evaluation of P Interactions in Granulocytes," N.I.H. N.I.D.R., 7/1/86 - 6/30/90 ($333,591).

Principal Investigator, "Phorbol Esters and Human Monocytes: Biochemical Mechanisms," NIH, 1985-1988 ($333,106).

Principal Investigator, Extension with funds ($120,122) of July 1988 - March 1989. "Characterization of Nerve Agent Exposure on Alveolar Macrophage Function."

Principal Investigator, "Characterization of Nerve Agent Exposure on Alveolar Macrophage Function," Army, 1985-1988 ($354,318).

Co-Principal Investigator, Special Instrument Grant, Spex Fluorograph, DOD, 1987 ($75,000).

Principal Investigator, "A New Protein Kinase Modulates Monocyte Activity," American Heart Association, Va. Affiliate, July 1984 - June 1985 ($24,900).

Principal Investigator, "A Multicomponent Analysis of Steroid Release," RCDA IKO4M00565, 1979-1984 ($219,000).

Principal Investigator, "Evaluation of Trental in Healthy and Diseased Human Subjects," Hoechst-Roussel Pharmaceuticals, 3/84 - 1/85 ($60,000).

Principal Investigator, "Evaluation of Lever Research Products in Leukocytes from Healthy Human Subjects," Lever Brothers,

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Inc., renewable ($23,000).

Principal Investigator, "Lysosomal Enzyme Release from Human Monocytes," American Cancer Society, 11/82 - 10/83, IN-105G ($4,000).

Co-Principal Investigator, "The Effect of Selected Organic Contaminants in Drinking Water on the Functions of Reproductive, Nervous and Immune Systems - An Integrated Approach," EPA, 3/81 - 2/83 ($918,000).

Co-Principal Investigator, "Effects of Microwave Radiation on Cells in Culture," R808617-01, 1981-83 ($37,700) - EPA.

Co-Principal Investigator, "Metabolic Events Related to Macrophage Activation by MVE," NIH, CA29333-01, 1981-83 ($107,500).

Co-Investigator, "Excitation Secretion Coupling in Macrophages," Cystic Fibrosis, 1982-84 ($47,000).

Co-Principal Investigator, "X Band Radiation: Effects on Cells in Culture," Office of Naval Research, 1982-84 ($50,000).

Co-Principal Investigator, Clinical Research Center for Periodontal Disease, 7/1/78 - 8/30/83 ($1,912,270).

Co-Principal Investigator, "Development of Short Term Immunotoxicological Assays for the Prediction of Chronic Toxicological Response Induced by Environmental Chemicals," Army, 1979 ($97,000).

Co-Principal Investigator, "The Effects of Selected Organic Contaminants in Drinking Water on the Functions of Reproductive, Nervous and Immune Systems - An Integrated Approach," EPA, 10/21/79 - 11/20/81 ($177,329).

Principal Investigator, "Drugs of Abuse on Neutral Function in Tissue Culture," 1977-1979, NIDA DA 01637 ($84,360).

Co-Investigator, "Macrophage Mediated Nucleotides," American Cancer Society, 1M 122, 1976-1978 ($177,000).

Co-Investigator, "Cannabinoids as Anti-Neoplastic Drugs," NIH NCI-117551, 1975-1977 ($65,000).

Principal Investigator, "Mechanism of Action of Cannabinoids in Neoplasia," NIH 17840, 1975-1977 ($59,000).

Principal Investigator, "Cyclic Nucleotide Metabolism in Functional Mouse Adrenal Tumors Grown in Tissue Culture," A.D. Williams Research Award, 1974-1975 ($3,000).

TRAINING GRANTS:

Research Training in Cancer Etiology and Treatment - 1978-1984
Mechanisms of Cardiovascular Injury - 4/1/77 to 3/31/82
Toxicology Training Grant - 1978-

Cancer Training Grant - I.D. Goldman, Principal Investigator and R. A. Carchman

RESEARCH INTERESTS:

Molecular biology of hormone cell interactions
Relationship of signal transducers to cell function
Drug-cell interactions

INVITED SPEAKER:

Virginia Commonwealth University/Mathematical Association of America – Mathematical Curriculum for Health and Life Science Students, Richmond, VA - May, 2000

Health Canada - Evaluation of Potentially Less Hazardous Cigarette - 1998

Session Co-Chair at the Drug Information Association (DIA) Workshop - Second Annual DIA Workshop on Preclinical

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Computer & Statistical Applications, Baltimore, MD, 1990.

Response Surface Modeling of Multi-Agent Interactions, Parke-Davis, Ann Arbor, MI, 1988

FASEB, Model Drug Interactions, Las Vegas, NV, 1988

NINCDS sponsored, Phoenix, AZ, 1988

American Statistical Association, San Antonio, TX, 1988

People's Republic of China (Beijing, Xian, Chengdu, Chongqing, and Shanghai), August, 1987

Chaired, Symposium at the 1987 American Society of Pharmacology and Experimental Therapeutics, Honolulu, Hawaii, 1987

VIMS/VCU Immunotoxicology Symposium, Richmond, VA, 1987

Frederick Cancer Institute of the National Cancer Institute, Talk on Response Surface Modeling on Cancer Therapy, May, 1987

Center for Innovative Technology, Talk on Tumor Promoters and Oncogenes, Richmond, VA, 1987

DuPont, Glenolen, PA, 1987

Albuquerque, NM, Immunotoxicology, 1986

RJR Nabisco, Winston-Salem, NC, July, 1986

Genetic Toxicology Association, Philadelphia, Pa., May 1986

Lederle Laboratories, Indiana, May 1986
"Response surface methodologies and toxicology"

Seminar at The Minority Access to Research Careers (MARC) sponsored by FASEB at Central State University, Wilberforce, Ohio on March 13th and 14th, 1986

Co-Chairman at SOT Symposium, New Orleans, La., March, 1986
"Complex Mixtures and Multiple Agent Interactions"

Co-Chairman and presenter at the Massey Cancer Center symposium on "Biomedical Applications of Response Surface Methodologies," April, 1986

Workshop on Environmental Toxicity and the Aging Process, The Johns Hopkins Onocology Center, Baltimore, Maryland, October 1985

Invited Speaker at the Virginia Heart Institute, Richmond, VA, October 1985

Army Biosciences Review Meeting, Johns Hopkins University, MD, May 1985

Philip Morris, USA, Richmond, VA, January 1985

Inst. for Chem. Defense, Edgewood Arsenal, MD, June, Sept. 1984, April 1985

Chemical Industry Institute of Toxicology, Research Triangle Park, NC, September 1984

University of Utah, Salt Lake City, UT, August 1984

National Institutes of Health, Bethesda, MD, August 1984

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FASEB Workshop, Saxton River, VT, July 1984

Emory University School of Medicine, Atlanta, GA, November 4, 1983

Immunotoxicology Workshop, National Institute of Environmental Health Sciences, Research Triangle Park, NC, October 17-18, 1983

Clinical Research Center for Periodontal Disease, Symposium, February 25, 1983, Medical College of Virginia

Symposium on Environmental Health Research, April 9-10, 1983, Chicago, IL

Chemical Industry Institute of Toxicology, 1982

National Institute of Environmental Health Science, 1982

State Water Control Board, Henrico, VA, 1981

EPA-HERL Symposium, Cincinnati, OH, 1981

Mount Zion Research Center, San Francisco, CA, 1980

Georgetown University, Washington, DC, 1980

International Study Center for Environmental Health Sciences - Halocarbon Symposium, Washington, DC, 1980

International Pharmacology Meetings, France, Drug Abuse Symposium, 1978

International Pharmacology Meetings, Finland, Marihuana Satellite Symposium, 1976

Prepared health assessment chapters for consent decree documents for the Environmental Protection Agency (Drinking Water) on:
1) Ethylbenzene
2) Diphenylhydrazine

Reviewed for the EPA the health effects assessment chapters on:
1) Benzidine
2) Chlorinated phenols
3) Naphthalene
4) Nitrobenzene
5) Dichloropropane/Dichloropropene
6) Chlorinated benzenes
7) 3,3'-Dichlorodibenzidene
8) Mercury
9) Phthalate esters

Prepared and published human health effects documents for EPA on:
1) Trichloroethylene
2) Methylchloroform
3) Methylene chloride
4) Freon 113
5) Phthalate esters

CONSULTANT:

Consultant, Advisory Board, Virginia Center for Innovative Technology, Biotechnology

Consultant, National Institute of Neurological Childhood Disease and Stroke

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Consultant, U.S. Forestry Service and Bureau of Land Management

Consultant, Center for Disease Control, Center for Environmental Health and Injury Control

Consultant, NIH Epilepsy Branch

Consultant to the Chemical Manufacturers Association on the Water Criteria Assessment - EPA Documents on:
1) Benzene

Prepared document for the American Petroleum Institute on:
1) Chloroform

Prepared document for General Dynamics, Inc. on:
1) Trichlorotrifluoroethane (FC-113)

Scientific Applications Inc.
Department of the Army
Hoechst-Roussel
Lever Research
Rhone Poulenc
Eastern Research Group
Environmental Protection Agency
Department of Justice
Centers for Disease Control

PUBLICATIONS: (Peer Reviewed)

Manuscripts:

1. Weinstein, I.B., Carchman, R.A., Marner, E. and Hirschberg, E.: Miracil D: Effect on nucleic acid synthesis, protein synthesis, and enzyme induction in Escherichia coli. Biochim. Biophys. Acta 142:440-449, 1967.

2. Hirschberg, E., Weinstein, I.B., Gerstein, N., Marner, E. and Carchman, R.A.: Structure-activity studies on the mechanism of action of miracil D. Cancer Res. 28:601-607, 1968.

3. Hirschberg, E., Ceccarini, C., Osnos, M. and Carchman, R.A.: Effects of inhibitors of nucleic acid and protein synthesis on growth and aggregation of the cellular slime mold Dictyostelium discoideum. Proc. Natl. Acad. Sci. 61:316-323, 1968.

4. Carchman, R.A., Hirschberg, E. and Weinstein, I.B.: Miracil D: Effect on the viscosity of DNA. Biochim. Biophys. Acta 179:158-164, 1969.

5. McMillan, D.E., Wolf, P.S. and Carchman, R.A.: Antagonism of the behavioral effects of morphine and methadone by narcotic antagonists in the pigeon. J. Pharmacol. Exp. Therap. 175:443-458, 1970.

6. Carchman, R.A., Jaanus, S.D. and Rubin, R.P.: The role of adrenocorticotropin and calcium in adenosine cyclic 3',5'-phosphate production and steroid release from the isolated, perfused cat adrenal gland. Molec. Pharmacol. 7(50):491-499, 1971.

7. Rubin, R.P., Carchman, R.A. and Jaanus, S.D.: Further studies on the relationship between cyclic AMP levels and adrenocortical activity. Endocrinol. 91(4):887-895, 1972.

8. Rubin, R.P., Carchman, R.A. and Jaanus, S.D.: The role of calcium and adenosine cyclic 3',5'-phosphate in the action of adrenocorticotropin. Nature 240(100):150-151, 1972.

9. Rein, A., Carchman, R.A., Johnson, G.S. and Pastan, I.: Simian virus 40 rapidly lowers cAMP levels in mouse cells. Biochem. Biophys. Res. Commun. 52:899-904, 1973.

10. Willingham, M.C., Carchman, R.A. and Pastan, I.: A mutant of 3T3 cells with cyclic AMP metabolism sensitive to

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temperature change. Proc. Natl. Acad. Sci. 70(10):2906-2910, 1973.

11. Rubin, R.P., Jaanus, S.D., Carchman, R.A. and Puig, M.: Reversible inhibition of ACTH-induced corticosteroid release by cycloheximide: Evidence for an unidentified cellular messenger. Endocrinol. 93(3):575-580, 1973.

12. Anderson, W.B., Russell, T.R., Carchman, R.A. and Pastan, I.: Interrelationship between adenylate cyclase activity, adenosine 3',5'-cyclic monophosphate levels, and growth of cells in culture. Proc. Natl. Acad. Sci. 70:3802-3805, 1973.

13. Carchman, R.A., Johnson, G.S., Pastan, I. and Scolnick, E.M.: Studies on the levels of cyclic AMP in cells transformed by wild-type and temperature-sensitive Kirsten sarcoma virus. Cell 1:59-64, 1974.

14. Johnson, G.S., D'Armiento, M. and Carchman, R.A.: N^-substituted adenines induce cell elongation independent of the intracellular cyclic AMP levels. Exp. Cell Res. 85:47-56, 1974.

15. Munson, A.E., Harris, L.S., Friedman, M.A., Dewey, W.L. and Carchman, R.A.: Antineoplastic activity of cannabinoids. J. Natl. Can. Inst. 55(3):597-602, 1975.

16. Rubin, R.P., Laychock, S.G., Warner, W. and Carchman, R.A.: The interaction of cyclic AMP, prostaglandins, and calcium on secretion by the adrenal gland. Estratto da "Studi Sassaresi," Vol. 53, Fasc. 1-2, pp. 1-4, 1975.

17. Carchman, R.A., Harris, L.S. and Munson, A.E.: The inhibition of DNA synthesis by cannabinoids. Canc. Res. 36:95-100, 1976.

18. White, A.C., Munson, J.A., Munson, A.E. and Carchman, R.A.: The effects of tetrahydrocannabinol in Lewis lung adenocarcinoma cells in tissue culture. J. Natl. Canc. Inst. 56(3):655-658, 1976.

19. Rechler, M.M., Bruni, C.B., Podskalny, J.M. and Carchman, R.A.: DNA synthesis in cultured human fibroblasts. Supramolec. Results 41:159-164, 1976.

20. Rechler, M.W., Bruni, C.B., Podskalny, J.M., Warner, W. and Carchman, R.A.: DNA synthesis in cultured human fibroblasts: Modulation by 3',5'-cyclic adenosine monophosphate. Exp. Cell Res. 104:411-422, 1977.

21. Warner, W., Harris, L.S. and Carchman, R.A.: Inhibition of corticosteroidogenesis by D(-tetrahydrocannabinol. Endocrinol. 101:1815-1820, 1977.

22. End, D.W., Thoursen, K., Dewey, W.L. and Carchman, R.A.: A comparative study of the disposition of (-) tetrahydrocannabinol in neuroblastoma and glioma cells in tissue culture: In relation to cellular impairment. Molec. Pharmacol. 13:867-871, 1977.

23. Warner, W. and Carchman, R.A.: Effects of ruthenium red, A23187 and D-600 on steroidogenesis in Y-1 cells. Biochim. Biophys. Acta 528:409-415, 1978.

24. Harris, L.S., Carchman, R.A. and Martin, B.R.: Evidence for the existence of specific cannabinoid binding sites. (Otto Krayer Symposium, March 10-12, 1978, Tuscon, Arizona) Life Sciences 22:1131-1138, 1978.

25. Goodell, E.M., Bilgin, S. and Carchman, R.A.: Biochemical characteristics of phagocytosis in the P388D1 cells. Exp. Cell. Res. 114:57-62, 1978.

26. Aceto, M., Carchman, R.A., Harris, L.S. and Flora, R.: Caffeine elicited withdrawal signs in morphine-dependent rhesus monkeys. Eur. J. Pharmacol. 50:203-207, 1978.

27. Ellis, E.F., Shen, J.C., Schrey, M.P., Carchman, R.A. and Rubin, R.P.: Prostacyclin: A potent stimulator of adrenal steroidogenesis. Prostaglandins 16:483-490, 1978.

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28. Carmines, E.L., Carchman, R.A. and Borzelleca, J.F.: Kepone: Cellular sites of action. J. Tox. Appl. Pharmacol. 49:543-550, 1979.

29. End, D.W., Carchman, R.A., Ameen, R. and Dewey, W.L.: Inhibition of rat brain mitochondrial calcium transport by chlordecone. Tox. Appl. Pharmacol. 51:189-196, 1979.

30. Laskin, D.L., Laskin, J.D., Weinstein, I.B. and Carchman, R.A.: Modulation of phagocytosis by tumor promoters and epidermal growth factor in normal and transformed macrophages. Can. Res. 40i:1028-1035, 1980.

31. Carchman, R.A., Shen, J.C., Bilgin, S. and Rubin, R.P.: Diverse effects of protacyclin and corticotropin on calcium modulation of cyclic AMP and steroid production in normal and tumor cells of adrenal cortex. Biochem. Pharm. 29:2213-2218, 1980.

32. Kessler, F.K., Goodell, E.M. and Carchman, R.A.: P338D1: Calcium and the phagocytosis of Listeria monocytogenes. Cell Calcium 1:181-194, 1980.

33. Kessler, F.K., Laskin, D.S. and Carchman, R.A.: Assessment of somatogenotoxicity of providone-iodine using two in vitro assays. J. Environ. Path. and Toxicol. 4-2,3:327-335, 1980.

34. Carmines, E.L., Carchman, R.A. and Borzelleca, J.F.: Method for the evaluation of dose effect data using a programmable calculator. J. Environ. Path. and Toxicol. 4:23-30, 1980.

35. White, J.C., Carchman, R.A. and Goldman, I.D.: The role of cyclic nucleotides in the metabolism of methotrexate by Ehrlich ascites cells. Canc. Res. 40:2400-2404, 1980.

36. Laskin, D.L., Laskin, J.L., Weinstein, I.B. and Carchman, R.A.: Modulation of macrophage chemotaxis by tumor promoting phorbol esters. Canc. Res. 41:1923-1928, 1981.

37. End, D.W., Carchman, R.A. and Dewey, W.L.: Interactions of narcotics with synaptosomal calcium transport. Biochem. Pharmacol. 30:674-676, 1981.

38. Laskin, D.L., Laskin, J.D., Kessler, F.K., Weinstein, I.B. and Carchman, R.A.: Enhancement of macrophage-induced cytotoxicity by phorbol ester tumor promoters. Cancer Res. 41:4523-4528, 1981.

39. End, D.W., Carchman, R.A. and Dewey, W.L.: Neurochemical correlates of chlordecone neurotoxicity. J. Toxicol. Environ. Health 8:707-718, 1981.

40. Warner, W. and Carchman, R.A.: Effect of ionophore A23187 on calcium fluxes from cultured adrenal cells. Biochim. Biophys. Acta 645:346-350, 1981.

41. Sanders, V.M., Kauffmann, B.M., White, K.L., Sain, L.E., Douglas, K.A., Carchman, R.A., Borzelleca, J. and Munson, A.E.: Humoral immune status of mice exposed to dichloroethylene. Tox. Appl. Pharmacol. 62:358-368, 1982.

42. Smith, B.M., Kessler, F.K., Carchman, S.H. and Carchman, R.A.: The role of calcium in macrophage chemotaxis to the phorbol ester tumor promoter TPA. Cell Calcium 3:503-514, 1982.

43. Thomas, J., Carver, M., Haisch, C., Thomas, F., Welch, J. and Carchman, R.A.: Differential effects of intravenous anaesthetic agents on cell-mediated immunity in the rhesus monkey. Clin. Exp. Immunol. 47:457-466, 1982.

44. Debski, B.F., Ranney, R.R. and Carchman, R.A.: The alterative effect of isobutyl methylxanthine in hypofunctional human neutrophil chemotaxis. Biochim. Biophys. Res. Comm. 108:1228-1234, 1982.

45. Smith, B.M., Sturm, R.J. and Carchman, R.A.: Calcium modulation of phorbol ester induced alterations in macrophage morphology. Canc. Res. 43:3385-3391, 1983.

46. Sturm, R.J., Smith, B.M., Lane, R.W., Laskin, D.L., Harris, L.S. and Carchman, R.A.: Agonist-antagonist interactions of phorbol esters in the macrophage. Canc. Res. 43:4552-4556, 1983.

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47. Charles, J.L., Jacobson-Kram, D., Borzelleca, J.F. and Carchman, R.A.: The kinetics of in vivo sister chromatid exchange induction in mouse bone marrow cells by alkylating agents. I. Cyclophosphamide. Environ. Mutagen. 5:825-834, 1983.

48. Skalsky, H.L. and Carchman, R.A.: Aluminum homeostasis in man. J. Am. College Toxicol., J. Am. Coll. Toxicol. 2:405-423, 1983.

49. Fowler, A.A., Fisher, B.J., Centor, R.M. and Carchman, R.A.: Transition of neutrophil chemotactic and secretory processes in patients developing the adult respiratory disease syndrome. Am. J. Pathol. 116:427-435, 1984.

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51. Carter, W.H., Jr., Jones, E.E. and Carchman, R.A.: Application of response surface methods for evaluating the interactions of soman, atropine, and pralidioxime chloride. Fundamental and Applied Toxicology 5:S232-S241, 1985.

52. Jones, D.E., Carter, W.H., Jr. and Carchman, R.A.: Assessing pyridostigmine efficacy by response surface modeling. Fundamental and Applied Toxicology 5:S242-S251, 1985.

53. Smith, B.M., Warner, W. and Carchman, R.A.: Alterations in calcium metabolism in phorbol ester-treated mouse peritoneal macrophages. Cell Calcium 6:371-383, 1985.

54. Cabral, F., Cline, M., Carchman, R.A. and Marciano, R.A.: Movement of Negleria Fowleri stimulated by mammalian cells in vitro. J. of Protozoology 33(1):10-13, 1986.

55. Charles, J.D., Jacobson-Kram, D., Condie, L.W., Jr., Borzelleca, J.F. and Carchman, R.A.: The kinetics of in vivo sister chromatid exchange induction in mouse bone marrow cells by ethylnitrosourea and methylnitrosourea. Toxicol. and Appld. Pharm. 84:56-65, 1986.

56. Lane, R.W., Sturm, R.J., Borzelleca, J.F. and Carchman, R.A.: Effect of in vitro differentiation on phorbol diester receptor number in human promyelocytic leukemia (HL-60) cells. Can. Res. 46:3782-3788, 1986.

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58. Wilson, J.D., Carter, W.H., Jr. and Carchman, R.A.: Application of response surface methodology to detect interactions of genotoxic agents in cultured mammalian cells. J. Tox. Environ. Health 19:173-183, 1986.

59. Solana, R.P., Wilson, J., Chinchilli, V.M., Carter, W.H., Kessler, F. and Carchman, R.A.: Estimation and analysis of the concentration-response surfaces associated with multiple-agent combinations. Toxicol. and Appld. Pharm. 85:231-238, 1986.

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61. Solana, R.P., Chinchilli, V.M., Carter, W.H., Jr., Wilson, J.D. and Carchman, R.A.: The evaluation of biological interactions using response surface methodology. Cell Bio. and Toxicol. 3:263-277, 1987.

62. Solana, R.P., Chinchilli, V.M., Wilson, J.D., Carter, W.H., Jr. and Carchman, R.A.: Evaluation of the interaction of three genotoxic agents in eliciting sister-chromatid exchanges using response surface methodology. Fund. Applied Tox. 9:541-549, 1987.

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64. Kessler, F.K., Fisher, B.J., Bechard, D.E., Fowler, A.A. and Carchman, R.A.: Guinea pig alveolar macrophages: functional responsiveness. Lung. 166:33-46, 1987

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65. Strnad, C.F. and Carchman, R.A.: Human T lymphocyte mitogenesis in response to the B oligomer of pertussis toxin is associated with an early elevation in cytosolic calcium concentrations. FEBS Letters 225:16-20, 1987.

66. McCrady, C.W., Li, Fei, Grant, A.J., Merchant, R.E., and Carchman, R.A.: Alteration of human lymphokine activated killer (LAK) cell activity by manipulation of protein kinase C and cytosolic Ca. Cancer Research 48:635-640, 1988.

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69. Solana, R.P., Carter, W.H., Jr., Wilson, J.D., Chinchilli, V.M. and Carchman, R.A.: Qualitative evaluation of sister chromatid exchanges elicited by combinations of genotoxic compounds using response surface methodology. J. of Amer. College of Tox. 7(7):65-76, 1988.

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76. Massey, B.V., McCrady, C.W., Dunn, N.L., Russell, E.C. and Carchman, R.A.: Induction of tumoricidal activity and alterations of growth by interleukin-2 and manipulation of protein kinase C and cytosolic calcium in childhood acute lymphocytic leukemia cells. Leukemia Research, 3(8):602-610, 1989.

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78. Solana, Richard P., Gennings, C., Anderson, D., Carter, W.H., Jr., Carchman, R.A. and Harris, L.W.: Comparing the response surfaces of two cholinolytics when used in combination with physostigmine as a pretreatment against organophosphate challenge. Drug. Chem. Tox. 12(3&4):197-219, 1989.

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RICHARD A. CARCHMAN (Ph.D.)

Dr. Carchman is presently retired. Prior to retiring, Dr. Carchman was employed as Vice President of Research, Development and Engineering at Philip Morris Incorporated. Dr. Carchman received a Ph.D. in pharmacology from the State University of New York, Downstate Medical Center in 1972. Dr. Carchman also had post-doctoral training in molecular biology (Laboratory of Molecular Biology) at the National Cancer Institute, National Institutes of Health in 1974.

Dr. Carchman is a fact witness. He may also offer expert testimony in the following areas: past and present scientific knowledge relating to smoking and health; the pharmacology of nicotine, including Philip Morris' internal and external research regarding the pharmacological effects of nicotine; issues relating to Philip Morris' internal and external research concerning nicotine analogs; current and historical research activities, including research conducted by or for Philip Morris; development of cigarettes with lower "tar" and nicotine yields, and the scientific studies addressing the health effects of filter and low-yield products; the design and construction of cigarettes; issues related to molecular biology/carcinogenesis, issues related to internal and independent assessment of the ingredients/additives used in the manufacture of cigarettes, including their purpose and chemical and physiological effect; and Philip Morris' efforts to cooperate with and respond to certain governmental entities and public health organizations regarding cigarette design issues. Dr. Carchman may also offer opinions and testimony in response to related issues raised by Plaintiffs.

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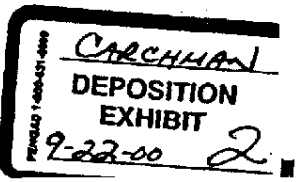

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CURRICULUM VITAE

RICHARD ALLAN CARCHMAN

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B.S.	6/66	Biology/Chemistry	Long Island University

HONORS: Research Career Development Award (NIH), (1979-1984)
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NIH Predoctoral Fellowship

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INSTITUTION	DEPARTMENT	RANK	DATES
Philip Morris USA	Research, Development & Engineering	Retired Vice President	2/1/99
Philip Morris USA	Research, Development & Engineering	V.P. RD&E	9/98-2/99
Philip Morris USA	Worldwide Scientific Affairs	V.P. Worldwide Sci. Affairs	12/97-8/98
Philip Morris USA	Research and Development	V.P. Sci. Affairs	11/96-11/97
Philip Morris USA	Research and Development	Group Director Sci. Affairs	9/96-10/96
Philip Morris USA	Research and Development	Director Sci. Affairs	10/92 - 8/96
Philip Morris USA	Research and Development	Manager	2/91 -9/92
Philip Morris USA	Research and Development	Principal Scientist	12/88 -2/91
MCV/VCU	Pharmacology/Toxicology	Affiliate Professor	12/88
	Biostatistics	Affiliate Professor	12/88
MCV/VCU	Massey Cancer Center	Associate Director	10/88 - 12/88
MCV/VCU	Pharmacology/Toxicology	Professor	7/86 - 12/88
MCV/VCU	Massey Cancer Center	Assoc. Scien. Dir.	11/86 - 10/88
MCV/VCU	Pharmacology/Toxicology	Associate Professor	7/81 - 6/86
MCV/VCU	Biostatistics(joint appointment)		2/85 -
MCV/VCU	Biology (joint appointment)		9/83 -
MCV/VCU	Pharmacology/Toxicology	Assistant Professor	5/74 - 6/81
NIH, NCI	Lab Molecular Biology	Postdoctoral Fellow	9/72 - 5/74
SUNY, Downstate	Pharmacology	NIH Predoct. Fellow	9/68 - 8/72
Columbia Univ.	Inst. for Cancer Res.	Tech. Res. Assistant	9/64 - 8/68

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MEMBERSHIPS - SCIENTIFIC, HONORARY AND PROFESSIONAL SOCIETIES:
American Society of Pharmacology and Experimental Therapeutics
Reticulendothelial Society
American College of Toxicology
International Union of Pharmacology, Toxicology Section
New York Academy of Sciences
Southeastern Regional Cancer Researchers
Drug Information Association
Sigma Xi
Society of Toxicology
American Association for Cancer Research
Center for Innovative Technology, Industrial Advisory Board, State of VA
State Council for Higher Education, Industrial member for Selecting Outstanding Teacher/Professor , State of VA

PROFESSIONAL ACTIVITIES:

NATIONAL/INTERNATIONAL:
Scientific Submissions to: US OSHA-1996, CalEPA-1997, National Toxicology Program-1998 (also presented to National Toxicology Program committee)
National Academy of Science/National Research Council Committee - 1998
Chairman, Board of Directors, Center for Indoor Air Research - 1998
Health Canada Expert Panel - 1998
National Institute of Environmental Health Sciences Training Grant (MCV/VCU) - 1998

Editorial and Journal Reviewer
Reviewer for Journal of Immunology
Reviewer for the Journal of Leukocyte Biology
Reviewer for The Journal of Pharmacology and Experimental Therapeutics
Reviewer for the American Society of Pharmacology and Toxicology
Reviewer for Cancer Research
Reviewer for Biochemistry
Reviewer for Biochemical Biophysic ACTA
Editorial Advisory Board for Advances in Modern Environmental Toxicology
Editorial Board, Toxicology and Industrial Hygiene

Review Committees
Reviewer for Research Proposals for the Alberta Heritage Foundation for Medical Research
Expert Panel for PHS/HHS, Center for Disease Control
Environmental Health and Injury Control Scientific Advisor to the Virginia Environmental Endowment Foundation
Reviewer for Research Proposals for the Center for Alternative Animal Research, Johns Hopkins University
NIAID Special Review on Cytomegalovirus National Institute on Drug Abuse Special Review Committee (AIDS)

Meetings
Co-Chairman, 1988 FASEB meetings, Las Vegas, Nevada
Chairman, "Design, Implementation and Analysis of Drug Interaction Studies," 1987 ASPET meetings, Honolulu, Hawaii
Chairman, Virginia Institute of Marine Science (VIMS)/Massey Cancer Center Symposium on Immunology/Toxicology/Cancer, Richmond, Virginia (1986)
Co-Chairman, Target Organ Toxicity (Endocrine), National Toxicology Program (1984) International Union of Pharmacology (IUPHAR), Section in Toxicology Program Committee, American College of Toxicology

University Committees:
MCV/VCU Cancer Center Member Reticuloendothelial System - Medical School
Recombinant DNA Committee
Dental Research Committee
Grievance Committee
Cancer Research Planning and Development Committee, Massey Cancer Center
Director - Leukocyte Cell Biology Program, Massey Cancer Center

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Committee on Committees
Associate Scientific Director, Massey Cancer Center
Member, AIDS Symposium Conference Planning Committee
Admissions Committee
Advisor to first year students
Alternative Language Requirement Committee
Chairman, Comprehensive Exam Committee
Chairman, Promotion Committee for Dr. B. R. Martin (School of Basic Health Sciences, 1987)
Member, Promotion & Tenure Committee for Dr. F. Cabral (School of Basic Health Sciences, 1987)
Member, Promotion & Tenure Committee for Dr. D. Gewirtz (School of Basic Health Sciences, 1987)
Member, Promotion & Tenure Committee for Dr. C. Gennings (School of Basic Health Sciences, 1988)
Member, Promotion Committee for Dr. S. Yanovich (School of Medicine, 1988)
Member, Promotion & Tenure Committee for Dr. L. Kaplowitz (School of Medicine, 1988)
Member, Promotion Committee for Dr. M. Kalimi (School of Health Sciences, 1988)
Chairman of Grievance Committee, School of Basic Health Science on Dr. Hsu and Dr. Macrina (1988)
Four year I & I Committee
Member Promotion Tenure Committee for Dr. K. L. White, Jr. (School of Basic Health Sciences), 1990.

GRADUATE STUDENTS TRAINED:

Predoctorals:
Estelle Goodell (Assistant Professor Basset/Columbia University)
Debra Laskin (Associate Professor, Rutgers University)
Bernard Debski (Chairman, Dept. of Periodontics, Univ. of Detroit)
James Charles (Vice President of Research, Philip Morris, USA)
Bonita Smith (NIH)
Barbara Kelly (Postdoctoral, MCV)
James Gaut (Postdoctoral Univ. of Rochester, N.Y.)
Dr. Richard Solana (Lieutenant Colonel, USAMRC, ICD, MD)
Karen Iorio (Postdoctoral, ADAMA)
Michael Shakarjian (Bristol Myers Squibb)
Dr. Ellen Byrne (Ass't Professor, School of Dentistry)
Todd O'Hara (Research Veterinarian)
Debbie Koller
Gerry Nixon

Co-Advisors:
David End (Pharmacologist - McNeil Laboratory)
Edward Carmines (Corporate Toxicologist, Hoechst-Roussel Pharmac.)
Richard Lane (VP-Lipton)

Predoctoral Committees:
Has been or is a member of 50 Ph.D. faculty advisory committees in the Departments of Pharmacology/Toxicology, Biochemistry, Physiology/Biophysics, Anatomy, Microbiology/Immunology and Biostatistics.

Postdoctorals:
William Warner (Associate Professor, NYU)
David Seyler (Assistant Professor, Columbia Hospital, Georgetown Univ.)
Joseph Monies (Institute for Chemical Defense, MD)
Colette F. Sirnad (Canada - Health & Safety)

Master of Science:
Jennifer Horn (M.S.)
Charu Krishnamuvthy (M.S.)
Maria Shulletta (M.S.)
Cindy Boswell (M.S.)

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Research Associates:
Paul Klykken (Assistant Professor, University of Mississippi)
Robert Sturm (Scientist, Ayerst Research Lab., NJ)
Carl McCrady, Assistant Professor MCV
Caroline Kramer, Assistant Professor MCV)

Research Assistant:
Fay Kessler

Scientists:
Dr. Paul Baron (Sloan Kettering, Surgical Oncology)
Dr. A. A. Fowler, III (Pulmonary Medicine, MCV)
Dr. Cecile Rose (Pulmonary & Environmental Medicine. Col.)
Dr. Scott Woolgen (Gastroenterology, MCV)
Dr. Gita Massey (Pediatrics, Oncology, MCV)
Dr. Li Fei (P.R. of China)
Dr. Tonfred Styblo (Surgical Oncology, MCV)
Dr. Zhi Gong Lin (P.R. of China)

ACTIVITIES - July-December 1988:

Teaching:
MI - Cell Biology of AIDS - 1 hour
MII - Antimicrobials and Antiparasites - 4 hours
General Princ. Tox. Mutagen/Carcin. - 4 hours
Biochemical Pharm. - Prot. Kinases - 1 1/2 hours
Microbial Biotechnology/Microbiology 691 - 3 hours

Reviewed - Scientific Reports:
Health Assessment Documents for EPA - Phtalate Esters
ATSDR/CDC - 1,2-dichloropropane
Health Canada - Development of Potentially Less Hazardous Cigarette - 1998

Edited - Journal of the American College of Toxicology (Vol. 7, No. 7, 1988):

Berenbaum, M.C.: Isobolographic, Algebraic, and Search Methods in the Analysis of Multiagent Synergy, pp. 17-28.

Staniswalis, J.G., and McCrady, C.W.: The Use of Kernel Estimators in Describing Human T Lymphocyte Proliferation Induced by Phorbol Esters and Ca Ionophore, pp. 29-41.

Wessinger, W.C., and Evans, E.B.: Modeling Multiple Agent Interactions in Behavioral Pharmacology, pp. 43-52.

Carter, W.H., Jr., Gennings, C., Staniswalis, J.G., Campbell, E.D., and White, K.L., Jr.: A Statistical Approach to the Construction and Analysis of Isobolograms, pp. 53-63.

Solana, R.P., Carter, W.H., Jr., Wilson, J.D., Chinchilli, V.M., and Carchman, R.A.: Qualitative Evaluation of Sister Chromatid Exchanges Elicited by Combinations of Genotoxic Compounds Using Response Surface Methodology, pp. 65-76.

Gessner, P.K.: A Straightforward Method for the Study of Drug Interactions: An Isobolographic Analysis Primer, pp. 77-102.

Gennings, C., Carchman, R.A., Carter, W.H., Jr., Campbell, E.D., Boyle, R.M., Staniswalis, J.G., Jones, D.E., Reid, F.M., and Koplovitz, I.: Assessing Physostigmine Efficacy by Response Surface Modeling: A Comparison to Pyridostigmine Efficacy, pp. 103-120.

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Graduate School: Lectures

Biochemical Pharmacology
Nurse Anesthetist
Microbial Biotechnology
General Pharmacology - Chemotherapy
Director - Advanced Toxicology
Co-Director - Environmental Toxicology
Advanced Cardiovascular
Biology of Cancer
Tumor Immunology
Tutorial
Principles of Toxicology
Biotechnology

Medical School: Lectures

Insulin
Antibiotics
Review for 4th Year - Medical Students - Chemotherapy
Review for Residents and Interns

RESEARCH SUPPORT:

Advisor, "Modulation of Growth and Function in Childhood Acute Lymphocytic Leukemia Cells by Interleukin-2 and Manipulation of Protein Kinase C and Calcium Homeostasis," American Cancer Society Clinical Oncology Career Development Award, Years - 3, $90,000 (Dr. G. Massey, PI).

Principal Investigator, American Cancer Society, Institutional Grant, 1988-1991, $30,000/yr.

Principal Investigator, "Models of Pulmonary Edema," Dept. Army, 1988-1991, $1,300,000.

Principal Investigator, "Exploration of T Lymphocytes Expandability in AIDS," NIH, 1987-1990, $465,000

Principal Investigator, Travel Funds for Symposium in Honolulu, Hawaii, D.O.D., ($11,599) August, 1987.

Principal Investigator, "Application of Response Surface Methodologies for Determining Optimum Treatment Strategies for Nerve Threat Agents," U.S. Army, 1986-1990 ($1,100,000).

Advisor, "Biochemical Evaluation of F-Interactions in Granulocytes," N.I.H. N.I.D.R., 7/1/86 - 6/30/90 ($333,591).

Principal Investigator, "Phorbol Esters and Human Monocytes: Biochemical Mechanisms," NIH, 1985-1988 ($333,106).

Principal Investigator. Extension with funds ($120,122) of July 1988 - March 1989. "Characterization of Nerve Agent Exposure on Alveolar Macrophage Function."

Principal Investigator, "Characterization of Nerve Agent Exposure on Alveolar Macrophage Function," Army, 1985-1988 ($354,318).

Co-Principal Investigator, Special Instrument Grant, Spex Fluorograph, DOD, 1987 ($75,000).

Principal Investigator, "A New Protein Kinase Modulates Monocyte Activity," American Heart Association, Va. Affiliate, July 1984 - June 1985 ($24,900).

Principal Investigator, "A Multicomponent Analysis of Steroid Release," RCDA IKO4M00565, 1979-1984 ($219,000).

Principal Investigator, "Evaluation of Trental in Healthy and Diseased Human Subjects," Hoechst-Roussel Pharmaceuticals, 3/84 - 1/85 ($60,000).

Myocardial Infarction Study

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Principal Investigator, "Evaluation of Lever Research Products in Leukocytes from Healthy Human Subjects," Lever Brothers, Inc., renewable ($23,000).

Principal Investigator, "Lysosomal Enzyme Release from Human Monocytes," American Cancer Society, 11/82 - 10/83, IN-105G ($4,000).

Co-Principal Investigator, "The Effect of Selected Organic Contaminants in Drinking Water on the Functions of Reproductive, Nervous and Immune Systems - An Integrated Approach," EPA, 3/81 - 2/83 ($918,000).

Co-Principal Investigator, "Effects of Microwave Radiation on Cells in Culture," R808617-01, 1981-83 ($37,700) - EPA.

Co-Principal Investigator, "Metabolic Events Related to Macrophage Activation by MVE," NIH, CA29333-01, 1981-83 ($107,500).

Co-Investigator, "Excitation Secretion Coupling in Macrophages," Cystic Fibrosis, 1982-84 ($47,000).

Co-Principal Investigator, "X Band Radiation: Effects on Cells in Culture," Office of Naval Research, 1982-84 ($50,000).

Co-Principal Investigator, Clinical Research Center for Periodontal Disease, 7/1/78 - 8/30/83 ($1,912,270).

Co-Principal Investigator, "Development of Short Term Immunotoxicological Assays for the Prediction of Chronic Toxicological Response Induced by Environmental Chemicals," Army, 1979 ($97,000).

Co-Principal Investigator, "The Effects of Selected Organic Contaminants in Drinking Water on the Functions of Reproductive, Nervous and Immune Systems - An Integrated Approach," EPA, 10/21/79 - 11/20/81 ($177,329).

Principal Investigator, "Drugs of Abuse on Neutral Function in Tissue Culture," 1977-1979, NIDA DA 01637 ($84,360).

Co-Investigator, "Macrophage Mediated Nucleotides," American Cancer Society, 1M 122, 1976-1978 ($177,000).

Co-Investigator, "Cannabinoids as Anti-Neoplastic Drugs," NIH NCI-117551, 1975-1977 ($65,000).

Principal Investigator, "Mechanism of Action of Cannabinoids in Neoplasia," NIH 17840, 1975-1977 ($59,000).

Principal Investigator, "Cyclic Nucleotide Metabolism in Punctional Mouse Adrenal Tumors Grown in Tissue Culture," A.D. Williams Research Award, 1974-1975 ($3,000).

TRAINING GRANTS:

Research Training in Cancer Etiology and Treatment - 1978-1984
Mechanisms of Cardiovascular Injury - 4/1/77 to 3/31/82
Toxicology Training Grant - 1978-

Cancer Training Grant - I.D. Goldman, Principal Investigator and R. A. Carchman

RESEARCH INTERESTS:

Molecular biology of hormone cell interactions
Relationship of signal transducers to cell function
Drug-cell interactions

INVITED SPEAKER:

Health Canada - Evaluation of Potentially Less Hazardous Cigarette - 1998

Session Co-Chair at the Drug Information Association (DIA) Workshop - Second Annual DIA Workshop on Preclinical Computer & Statistical Applications, Baltimore, MD, 1990.

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Response Surface Modeling of Multi-Agent Interactions, Parke-Davis, Ann Arbor, MI, 1988

FASEB, Model Drug Interactions, Las Vegas, NV, 1988

NINCDS sponsored, Phoenix, AZ, 1988

American Statistical Association, San Antonio, TX, 1988

People's Republic of China (Beijing, Xian, Chengdu, Chongqing, and Shanghai), August, 1987

Chaired, Symposium at the 1987 American Society of Pharmacology and Experimental Therapeutics, Honolulu, Hawaii, 1987

VIMS/VCU Immunotoxicology Symposium, Richmond, VA, 1987

Frederick Cancer Institute of the National Cancer Institute, Talk on Response Surface Modeling on Cancer Therapy, May, 1987

Center for Innovative Technology, Talk on Tumor Promoters and Oncogenes, Richmond, VA, 1987

DuPont, Glenolen, PA, 1987

Albuquerque, NM, Immunotoxicology, 1986

RJR Nabisco, Winston-Salem, NC, July, 1986

Genetic Toxicology Association, Philadelphia, Pa., May 1986

Lederle Laboratories, Indiana, May 1986
"Response surface methodologies and toxicology"

Seminar at The Minority Access to Research Careers (MARC) sponsored by FASEB at Central State University, Wilberforce, Ohio on March 13th and 14th, 1986

Co-Chairman at SOT Symposium, New Orleans, La., March, 1986
"Complex Mixtures and Multiple Agent Interactions"

Co-Chairman and presenter at the Massey Cancer Center symposium on "Biomedical Applications of Response Surface Methodologies," April, 1986

Workshop on Environmental Toxicity and the Aging Process, The Johns Hopkins Onocology Center, Baltimore, Maryland, October 1985

Invited Speaker at the Virginia Heart Institute, Richmond, VA, October 1985

Army Biosciences Review Meeting, Johns Hopkins University, MD, May 1985

Philip Morris, USA, Richmond, VA, January 1985

Inst. for Chem. Defense, Edgewood Arsenal, MD, June, Sept. 1984, April 1985

Chemical Industry Institute of Toxicology, Research Triangle Park, NC, September 1984

University of Utah, Salt Lake City, UT, August 1984

National Institutes of Health, Bethesda, MD, August 1984

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FASEB Workshop, Saxton River, VT, July 1984

Emory University School of Medicine, Atlanta, GA, November 4, 1983

Immunotoxicology Workshop, National Institute of Environmental Health Sciences, Research Triangle Park, NC, October 17-18, 1983

Clinical Research Center for Periodontal Disease, Symposium, February 25, 1983, Medical College of Virginia

Symposium on Environmental Health Research, April 9-10, 1983, Chicago, IL

Chemical Industry Institute of Toxicology, 1982

National Institute of Environmental Health Science, 1982

State Water Control Board, Henrico, VA, 1981

EPA-HERL Symposium, Cincinnati, OH, 1981

Mount Zion Research Center, San Francisco, CA, 1980

Georgetown University, Washington, DC, 1980

International Study Center for Environmental Health Sciences - Halocarbon Symposium, Washington, DC, 1980

International Pharmacology Meetings, France, Drug Abuse Symposium, 1978

International Pharmacology Meetings, Finland, Marihuana Satellite Symposium, 1976

Prepared health assessment chapters for consent decree documents for the Environmental Protection Agency (Drinking Water) on:
1) Ethylbenzene
2) Diphenylhydrazine

Reviewed for the EPA the health effects assessment chapters on:
1) Benzidine
2) Chlorinated phenols
3) Naphthalene
4) Nitrobenzene
5) Dichloropropane/Dichloropropene
6) Chlorinated benzenes
7) 3,3'-Dichlorodibenzidene
8) Mercury
9) Phthalate esters

Prepared and published human health effects documents for EPA on:
1) Trichloroethylene
2) Methylchloroform
3) Methylene chloride
4) Freon 113
5) Phthalate esters

CONSULTANT:

Consultant, Advisory Board, Virginia Center for Innovative Technology, Biotechnology

Consultant, National Institute of Neurological Childhood Disease and Stroke

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Consultant, U.S. Forestry Service and Bureau of Land Management

Consultant, Center for Disease Control, Center for Environmental Health and Injury Control

Consultant, NIH Epilepsy Branch

Consultant to the Chemical Manufacturers Association on the Water Criteria Assessment - EPA Documents on:
1) Benzene

Prepared document for the American Petroleum Institute on:
1) Chloroform

Prepared document for General Dynamics, Inc. on:
1) Trichlorotrifluoroethane (FC-113)

Scientific Applications Inc.
Department of the Army
Hoechst-Roussell
Lever Research
Rhone Poulenc
Eastern Research Group
Environmental Protection Agency
Department of Justice
Centers for Disease Control

PUBLICATIONS: (Peer Reviewed)

Manuscripts:

1. Weinstein, I.B., Carchman, R.A., Marner, E. and Hirschberg, E.: Miracil D: Effect on nucleic acid synthesis, protein synthesis, and enzyme induction in Escherichia coli. Biochim. Biophys. Acta 142:440-449, 1967.

2. Hirschberg, E., Weinstein, I.B., Gersten, N., Marner, E. and Carchman, R.A.: Structure-activity studies on the mechanism of action of miracil D. Cancer Res. 28:601-607, 1968.

3. Hirschberg, E., Ceccarini, C., Osnos, M. and Carchman, R.A.: Effects of inhibitors of nucleic acid and protein synthesis on growth and aggregation of the cellular slime mold Dictyostelium discoideum. Proc. Natl. Acad. Sci. 61:316-323, 1968.

4. Carchman, R.A., Hirschberg, E. and Weinstein, I.B.: Miracil D: Effect on the viscosity of DNA. Biochim. Biophys. Acta 179:158-164, 1969.

5. McMillan, D.E., Wolf, P.S. and Carchman, R.A.: Antagonism of the behavioral effects of morphine and methadone by narcotic antagonists in the pigeon. J. Pharmacol. Exp. Therap. 175:443-458, 1970.

6. Carchman, R.A., Jaanus, S.D. and Rubin, R.P.: The role of adrenocorticotropin and calcium in adenosine cyclic 3',5'-phosphate production and steroid release from the isolated, perfused cat adrenal gland. Molec. Pharmacol. 7(50):491-499, 1971.

7. Rubin, R.P., Carchman, R.A. and Jaanus, S.D.: Further studies on the relationship between cyclic AMP levels and adrenocortical activity. Endocrinol. 91(4):887-895, 1972.

8. Rubin, R.P., Carchman, R.A. and Jaanus, S.D.: The role of calcium and adenosine cyclic 3',5'-phosphate in the action of adrenocorticotropin. Nature 240(100):150-151, 1972.

9. Rein, A., Carchman, R.A., Johnson, G.S. and Pastan, I.: Simian virus 40 rapidly lowers cAMP levels in mouse cells. Biochem. Biophys. Res. Commun. 52:899-904, 1973.

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10. Willingham, M.C., Carchman, R.A. and Pastan, I.: A mutant of 3T3 cells with cyclic AMP metabolism sensitive to temperature change. Proc. Natl. Acad. Sci. 70(10):2906-2910, 1973.

11. Rubin, R.P., Jaanus, S.D., Carchman, R.A. and Puig, M.: Reversible inhibition of ACTH-induced corticosteroid release by cycloheximide: Evidence for an unidentified cellular messenger. Endocrinol. 93(3):575-580, 1973.

12. Anderson, W.B., Russell, T.R., Carchman, R.A. and Pastan, I.: Interrelationship between adenylate cyclase activity, adenosine 3',5'-cyclic monophosphate levels, and growth of cells in culture. Proc. Natl. Acad. Sci. 70:3802-3805, 1973.

13. Carchman, R.A., Johnson, G.S., Pastan, I. and Scolnick, E.M.: Studies on the levels of cyclic AMP in cells transformed by wild-type and temperature-sensitive Kirsten sarcoma virus. Cell 1:59-64, 1974.

14. Johnson, G.S., D'Armiento, M. and Carchman, R.A.: N^-substituted adenines induce cell elongation independent of the intracellular cyclic AMP levels. Exp. Cell Res. 85:47-56, 1974.

15. Munson, A.E., Harris, L.S., Friedman, M.A., Dewey, W.L. and Carchman, R.A.: Antineoplastic activity of cannabinoids. J. Natl. Can. Inst. 55(3):597-602, 1975.

16. Rubin, R.P., Laychock, S.G., Warner, W. and Carchman, R.A.: The interaction of cyclic AMP, prostaglandins, and calcium on secretion by the adrenal gland. Estratto da "Studi Sassaresi," Vol. 53, Fasc. 1-2, pp. 1-4, 1975.

17. Carchman, R.A., Harris, L.S. and Munson, A.E.: The inhibition of DNA synthesis by cannabinoids. Canc. Res. 36:95-100, 1976.

18. White, A.C., Munson, J.A., Munson, A.E. and Carchman, R.A.: The effects of tetrahydrocannabinol in Lewis lung adenocarcinoma cells in tissue culture. J. Natl. Canc. Inst. 56(3):655-658, 1976.

19. Rechler, M.M., Bruni, C.B., Podskalny, J.M. and Carchman, R.A.: DNA synthesis in cultured human fibroblasts. Supramolec. Results 41:159-166, 1976.

20. Rechler, M.W., Bruni, C.B., Podskalny, J.M., Warner, W. and Carchman, R.A.: DNA synthesis in cultured human fibroblasts: Modulation by 3',5'-cyclic adenosine monophosphate. Exp. Cell Res. 104:411-422, 1977.

21. Warner, W., Harris, L.S. and Carchman, R.A.: Inhibition of corticosteroidogenesis by D(-tetrahydrocannabinol. Endocrinol. 101:1815-1820, 1977.

22. End, D.W., Thoursen, K., Dewey, W.L. and Carchman, R.A.: A comparative study of the disposition of (-) tetrahydrocannabinol in neuroblastoma and glioma cells in tissue culture: In relation to cellular impairment. Molec. Pharmacol. 13:867-871, 1977.

23. Warner, W. and Carchman, R.A.: Effects of ruthenium red, A23187 and D-600 on steroidogenesis in Y-1 cells. Biochim. Biophys. Acta 528:409-415, 1978.

24. Harris, L.S., Carchman, R.A. and Martin, B.R.: Evidence for the existence of specific cannabinoid binding sites. (Otto Krayer Symposium, March 10-12, 1978. Tuscon, Arizona) Life Sciences 22:1131-1138, 1978.

25. Goodell, E.M., Bilgin, S. and Carchman, R.A.: Biochemical characteristics of phagocytosis in the P388D1 cells. Exp. Cell. Res. 114:57-62, 1978.

26. Accto, M., Carchman, R.A., Harris, L.S. and Flora, R.: Caffeine elicited withdrawal signs in morphine-dependent rhesus monkeys. Eur. J. Pharmacol. 50:203-207, 1978.

27. Ellis, E.F., Shen, J.C., Schrey, M.P., Carchman, R.A. and Rubin, R.P.: Prostacyclin: A potent stimulator of adrenal steroidogenesis. Prostaglandins 16:483-490, 1978.

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28. Carmines, E.L., Carchman, R.A. and Borzelleca, J.F.: Kepone: Cellular sites of action. J. Tox. Appl. Pharmacol. 49:543-550, 1979.

29. End, D.W., Carchman, R.A., Ameen, R. and Dewey, W.L.: Inhibition of rat brain mitochondrial calcium transport by chlordecone. Tox. Appl. Pharmacol. 51:189-196, 1979.

30. Laskin, D.L., Laskin, J.D., Weinstein, I.B. and Carchman, R.A.: Modulation of phagocytosis by tumor promoters and epidermal growth factor in normal and transformed macrophages. Can. Res. 40i:1028-1035, 1980.

31. Carchman, R.A., Shen, J.C., Bilgin, S. and Rubin, R.P.: Diverse effects of protacyclin and corticotropin on calcium modulation of cyclic AMP and steroid production in normal and tumor cells of adrenal cortex. Biochem. Pharm. 29:2213-2218, 1980.

32. Kessler, F.K., Goodell, E.M. and Carchman, R.A.: P338D1: Calcium and the phagocytosis of Listeria monocytogenes. Cell Calcium 1:181-194, 1980.

33. Kessler, F.K., Laskin, D.S. and Carchman, R.A.: Assessment of somatogenotoxicity of providone-iodine using two in vitro assays. J. Environ. Path. and Toxicol. 4-2,3:327-335, 1980.

34. Carmines, E.L., Carchman, R.A. and Borzelleca, J.F.: Method for the evaluation of dose effect data using a programmable calculator. J. Environ. Path. and Toxicol. 4:23-30, 1980.

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2.	Wagner, Bernard M. Letter. "The Mutagen = Carcinogen Controversy." Modern Pathology 3(5): 555-556.	00000000		
3.	Verordnungen Uber Tobakerzeugnisse (Tobakverordnung); Regulation Concerning Tobacco Products (Tobacco Regulation)	19771220		
4.	Van Proosdy, C. Smoking: Its Influence on the Individual and its Role in Social Medicine with Forward by R. Doll. Amsterdam: Elsevier Publishing Co., 1960.	19600000		
5.	Memorandum from A. Tricker to SA Worldwide re: "Nitrosamine research in Munich" and forwards the following abstract and report, Richter E. "Metabolism of 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone by precision-cut rodent and human liver and lung slices"	19971023	2063599499 2063599514 2063599524	2063599502 2063599516 2063599559
6.	Wynder, Ernst L. "The Place of Tobacco in the Etiology of Lung Cancer." Conn. State Med. J. 18(0): 321-329.	19540400		
7.	Ames, Bruce N. and Lois Swirsky Gold. "Dietary Carcinogens, Environmental Pollution, and Cancer: Some Misconceptions." Med. Oncol. & Tumor Pharm. 7(2/3): 69-85.	19900000		
8.	Objectives Results and Cost of Biological Studies By Consulting Laboratories 1959-1968	19690000/E	1000127014	1000127018
9.	Dunn, William L., ed. Smoking Behavior: Motives and Incentives. Washington, D.C.: V.H. Winston and Sons.	19730000		
10.	The Research Program of The Scientific Advisory Board To The Tobacco Industry Research Committee	19590700	2015067228	2015067238A
11.	Memorandum from Marketing Information & Analysis to George Yatunkis re: "De-Nic Shipment and Retail Test Market Performance"	19940802	2051001038	2051001047
12.	Board of Directors Presentation 19590930 by Dr. Robert DuPuis	19590930	1000305969	1000305990
13.	Memorandum from Frank E. Resnik to Helmut Wakeham re: "Highlights of The Discussion With Dr. A.J.P. Martin On The Chemistry of Burning Tobacco"	19600517	1001894297	1001894300
14.	Tobacco And Health - R&D Approach - Presentation to R&D Committee by Helmut Wakeham at meeting held in New York Office	19611115	1000277423	1000277447
15.	Memorandum from William L. Dunn to Abe Bavley re: "Additive for Providing Lung Impact in the Denicotinized Cigarette"	19630423	1001900169	
16.	Memorandum from R.H. Blackmore to Abe Bavley re: "Project 0100 - Objective For 1964"	19631121	1000825873	1000825876
17.	Operations Department Presentation To Philip Morris Board of Directors, Research And Development	19641028	1000307159	1000307164
18.	Chronic (48 Week) Smoking Study - Cynamolgus Monkeys Final Report Project No. 270-137	19680718	1001603219	1001603291
19.	Memorandum from Thomas S. Osdene to Helmut Wakeham re: "Visit With Dr A Burger, University of Virginia, Charlottesville, Virginia, On 19681216"	19681226	1004865688	1004865689
20.	Memorandum from Helmut Wakeham to Clifford H. Goldsmith re: "Proposal For A Biological Research Program"	19690701	1000217068	1000217084
21.	Ryan, Frank J. and B.R. Hancock, Philip Morris Research Center Special Report "Puffing Behavior On High And Low Delivery	19730900	1000354257	1000354277

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	Cigarettes"			
22.	Memorandum from E.B.[Ted] Sanders to Walter F. Gannon re: "Testing of Nicotine Analogues"	19740131	1000734574	1000734578
23.	Letter from Ernst L. Wynder to Clifford H. Goldsmith re: testing cigarettes for biological activity	19740530	1003710586	
24.	Schori, Thomas R. and Barbara W. Jones, Philip Morris Research Center Special Report "Does The Smoker Compensate For Changes In Delivery In Order To Regulate Intake (TNT-4)"	19740800	1000356550	1000356576
25.	Memorandum from William L. Dunn and R.M. Ikeda to Distribution re: "Sensory Experiences Associated with Smoking"	19740306	1002645522	1002645528
26.	National Cancer Institute, Smoking And Health Program, High Nicotine/Tar, Low Tar Cigarettes, Minutes of Meeting	19760505	1000022505	1000022519
27.	Smoking And Health Program, National Cancer Institute, Status Report	19760600	1003107637	1003107908
28.	Memorandum from Robert A. Pages to Thomas S. Osdene re: "Summary of The Evolution of In Vitro Assays At Philip Morris: 1973-1977"	19770325	1000053316	1000053317
29.	Letter from Thomas S. Osdene To Leo G. Abood about possible future collaboration	19780306	2022953899	
30.	Memorandum from Thomas S. Osdene to File re: "Recommendations For Long-term Plans For CTR"	19781113	2021016008	2021016010
31.	Long Term Planning - INBIFO	19790000/E	1000130662	1000130698
32.	Report by Arthur D. Little for Enviro Control, Inc., "Development of A Flavor System And Nicotine Mimic For Acceptability To Smokers of Candidate Potentially Less Hazardous Cigarettes, Final Report, Tasks I and II"	19790120	1003109604	1003109766
33.	Memorandum from Helmut Wakeham to Robert B. Seligman re: "Program Review-Psychology"	19790222	1000017226	1000017227
34.	Memorandum from Raymond Pagan to Robert B. Seligman re: "Program Review-Smoking Behavior"	19790223	1003293244	1003293245
35.	Memorandum from Victor J. DeNoble, William L. Dunn, Thomas S. Osdene, and Frank Ryan to Robert B. Seligman re: "Self-Administration - Reinforcement - 'Addiction'"	19800723	1003060621	
36.	Memorandum from Thomas S. Osdene to Helmut Wakeham re: "Tobacco Additives.	19800911	1000123779	1000123781
37.	Memorandum from Jeffrey I. Seeman to Thomas S. Osdene re: "Synthesis And Chemistry of Nicotine Analogues (19791001-19800930)"	19801020	2022953856	2022953860
38.	Memorandum from Jeffrey I. Seeman to Thomas S. Osdene re: "Future Work in the Nicotine Receptor Field"	19801020	2022953861	2022953862
39.	Memorandum from Victor J. DeNoble and Lisa Carron to Robert B. Seligman re: "Oral Presentation– Studies of Intraventricular Infusions of (-)-Nicotine On Behavior Maintained Under Fixed Ratio Schedules (FR)"	19810203	1000800117	1000800118
40.	Victor J. DeNoble handwritten notes re: "Possible Richmond Meeting Topic"	19810603	1000040405	1000040410
41.	Banyasz, Joseph L., Philip Morris Research Center Annual Report "1904 - Bioengineering Studies Annual Report"	19820521	1000403309	1000403355
42.	Memorandum from Victor J. DeNoble and Paul Mele to James L. Charles re: "Behavioral Effects of Termination of Chronically Administered Nicotine-Acetaldehyde Combinations on Lever	19831005	1003060631	1003060633

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	Pressing Maintained Under a Fixed Ratio Schedule of Food Presentation in Rats"			
43.	Letter from Ty Fujiwara to Ewald Roemer forwarding GLP Establishment Inspection Report for INBIFO	19831220	2501687702 2501687703	2501687702 2501687715
44.	Memorandum from Robert N. Ferguson to E.B. (Ted) Sanders re: "Focus Goal No. 1 Strategy"	19850415	2001244722	2001244730
45.	Letter from Dietrich Hoffmann to Jeffrey I. Seeman re: Dr. Seeman's paper in Tetrahedron on the chemistry of nicotine analogues	19850524	2022953597	
46.	Letter from Jeffrey I. Seeman to Dietrich Hoffmann re: responding to request for sample of 6-methylnicotine	19850530	2021621206	
47.	Letter from Dietrich Hoffmann to Jeffrey I. Seeman explaining his anticipated use of 6-methylnicotine	19850617	2021621208	2021621209
48.	Memorandum from Jeffrey I. Seeman to distribution requesting permission to supply Dietrich Hoffmann with 6-methylnicotine	19850619	2021621210	
49.	Letter from Dietrich Hoffmann to Jeffrey I. Seeman thanking him for sample of 6-methylnicotine	19850708	2058335236	
50.	Project "ART" (Alkaloid Reduced Tobacco)	19861111	2021559550	2021559572
51.	"Alkaloid Reduced Tobacco (ART) Program, Current Status And Plans For 1987"	19861100/E	2051841630	2051841644
52.	Warfield, A.H. Philip Morris Research Center Annual Report "6902 Annual Report--Biochemical Special Investigations"	19870807	2022171471	2022171541
53.	Memorandum from S. Pestun to M. Speck re: "NNK determination in an office"	19880831	2026209270	2026209272
54.	BETA Board Speech	19900627	2021113612	2021113623
55.	Memorandum from James L. Charles to Kenneth S. Houghton re: "Termination of the PMT Project"	19920803	2022850079	2022850080
56.	Ingredients Added to Tobacco in the Manufacture of Cigarettes by the Six Major American Cigarette Companies (list of 599 compounds and their uses)	19940412	2022878149	2022878198
57.	Letter from Wolf Reininghaus to Cathy Ellis re: "Bioavailability of Nicotine" [Parameters that influence bioavailability of nicotine]	19941115	2025988909	2025988912
58.	Memorandum from Rick P. Solana and George J. Patskan to Richard A. Carchman re: Toxicology Testing Guidelines for Philip Morris Worldwide Tobacco Product and Process Development	19950215	2057345096	2057345107
59.	CRC and INBIFO Laboratory Inspection Report performed by Philip Morris USA Scientific Advisory Board with appendices	19950511	2029255034	2029255042
60.	Letter from Richard A. Carchman to Docket Office, OSHA, re: OSHA Docket No. H-122, Submittal of Post-Hearing "Position Statements, Briefs, Recommendations and Rebuttal of Material Submitted During the Post-Hearing Comment Period" [5 Volumes]	19960208		
61.	Letter by Richard A. Carchman to Office of Environemental Health Hazard Assessment, Sacramento, CA forwarding Comments on OEHHA's "Health Effects of Exposure to Environmental Tobacco Smoke" [2 Volumes]	19970505		
62.	Memorandum from Jean-Jacques Piade to Robert N. Fergusson re: "Test-chamber NNK determinations in concentrated sidestream smoke" with attachments	19970512	2062574000 2062574017 2062574018	2062574016
63.	GLP - Bescheinigung (Lab Certificate of Compliance for INBIFO)	19970806	2501687700	2501687701
64.	1) EQUI-Effect Design For Subchronic Inhalation Toxicity Studies Comparing Conventional And Novel Cigarette Prototypes 2) Evaluation of An Electrically Heated Cigarette 3) Discrimination of	19980300	2062857534	2062857537

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	Cigarette Mainstream Smoke With The Neutral Red Uptake Cytotoxicity Assay 4) Discrimination of Cigarette Mainstream Smoke Condensates With The Salmonella Reverse Mutation Assay. The Toxicologist, An Official Publication of the Society of Toxicology and Abstract Issues of Toxicological Sciences, 42: 295; Abstracts of the 37th annual meeting 19980300.			
65.	Letter from Richard A. Carchman to C.W. Jameson re: "Comments on National Toxicology Program's (NTP) Proposal for Listing Environmental Tobacco Smoke (ETS) in the Report on Carcinogens, Ninth Edition" [Appendices 1-5, 6-8]	19980320		
66.	Publications By INBIFO/CRC (since 1972)	19980610	2501687750	2501687764
67.	Handwritten outline and notes titled "Inbifo Services Considered To Be Important And Necessary"	19790000/E	1000130554	1000130555
68.	Letter from Warren E. Claflin to Helmut Gaisch fowarding summaries of studies regarding mouth and finger placement	19830331	2022208747	2022208755
69.	Tobacco Institute Testing Laboratory Market Sample 36	19940303	2051995307	2051995391
70.	Millham, Oakley, Green and Merwin, Philip Morris Research Center "Technical Report No. 221--The Determination of Phenolics in Cigarette Smoke"	19630307	1000347135	1000347302
71.	Memorandum from Frank E. Resnik to John T. Landry re: "Dr. Wakcham's Presentation to the Board" and attached Report to the Board of Directors on 19671101	19671103	1000276918	1000276975
72.	Memorandum from L. Weissbecker to Helmut Wakeham "Low Benzo(a)pyrene Delivery Cigarette"	19650201	1001898083	1001898085
73.	Wynder, Ernst L. "Towards A Solution of the Tobacco-Cancer Problem." British Medical Journal 1(1): 1-3.	19570105		
74.	Van Duuren, B.L., A. Sivak, C. Katz, and S. Melchionae. "Cigarette Smoke Carcinogenesis: Importance of Tumor Promoters." Journal of the National Cancer Institute 47(1): 235-240.	19710700		
75.	Brunnemann, Klaus D., Walter Fink and Fritz Moser. "Analysis of Volatile Nitrosamines in Mainstream and Sidestream Smoke from Cigarettes by GLC-TEA." Oncology 37(4): 217-222.	19800000		
76.	McKay, Cheryl L., Robert N. Ferguson, and P. Glenn Baker, Philip Morris Research Center Special Report "Determination of Non-volatile Nitrosamines by GC/TEA Procedure. II. Filler and Mainstream Smoke Results"	19820518	1003121315	1003121338
77.	Memorandum from W.F. Kuhn to Thomas S. Osdene re: "Nitrosamine Investigation with Hoffman LaRoche"	19770321	1001809545	
78.	Letter from Dietrich Hoffmann to Thomas S. Osdene explaining the results of AHF investigation into the effect on nitrosamine yields of ascorbic acid additives	19810109	1000129524	1000129526
79.	Letter from Richard Klarberg to Thomas S. Osdene re: "On the Selective Reduction of Tobacco Specific N-Nitrosamines from Cigarette Smoke"	19801219	1003710151	1003710152
80.	Paine, John B., III, Ken Shafer, and Jay A. Jarvis, Philip Morris Research Center Completion Report "Cobalt Catalysts for Carbon Monoxide Oxidation in Smoking Articles." (Seton Hall Report)	19930000/E	2021349884	2021350031
81.	Memorandum from Melissa Jeltema to Peter Martin re: "Testing of De-Nicotinized Cigarettes"	19860610	2001260246	2001260247
82.	Roberts, Donald L. "Natural Tobacco Flavor" Recent Advances in Tobacco Science: Chemical and Sensory Aspects of Tobacco Flavor. 42nd Tobacco Chemists' Research Conference, Lexington KY 14: 49-	19881005		

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83.	Rose, Jed E., Donald P. Tashkin, Alan Ertle, Michael C. Zinser and Robert Lafer. "Sensory Blockade of Smoking Satisfaction" Pharmacology Biochemistry and Behavior 23(2): 289-93	19850800		
84.	Butschky, Marsha F., Denise Bailey, Jack E. Henningfield, and Wallace B. Pickworth. "Smoking Without Nicotine Delivery Decreases Withdrawal in 12-Hour Abstinent Smokers" Pharmacology Biochemistry & Behavior 50(1): 91-96	19950000		
85.	Levin, Edward D., Frederique Behm and Jed E. Rose. "The Use of Flavor in Cigarette Substitutes" Drug & Alcohol Dependence 26(2): 155-160.	19900000		
86.	Russell, M.A.H., M.J. Jarvis, C. Feyerabend, and Y. Saloojee. "Reduction of Tar Nicotine and Carbon Monoxide Intake in Low Tar Smokers." Journal Epidemiology and Community Health 40(1): 80-85.	19860000		
87.	Benowitz, Neal L. and Jack E. Henningfield. "Establishing a Nicotine Threshold for Addiction" New England Journal of Medicine 331(2): 123-125.	19940000	2024558842	2024558844
88.	Hasenfratz, M., B. Baldinger and K. Battig. "Nicotine or Tar Titration in Cigarette Smoking Behavior?" Psychopharmacology 112: 253-258.	19930000		
89.	Bassfield, Ronald L. "The Interaction of Lanthanide Shift Reagants with Cationic Sites: A 1H and 13C NMR Study of the Solution Geometry of Nicotine N-Methiodide." J. Amer. Chem. Soc. 105(13): 4168-4172.	19830000	2047104834	2047104838
90.	Chavdarian, Charles G. "Optically Active Nicotine Analogues. Synthesis of (S)-(-)-2,5-Dihydro-1-methyl-2-(3-pyridyl)pyrrole ((S)-(-)-3',4'-Dehydronicotine)." J. Org. Chem. 48(9): 1529-1531.	19830000	2021408455	2021408457
91.	Comes, R.A., M.T. Core, M.D. Edmonds, W.B. Edwards, III, R.W. Jenkins, Jr. "The Preparation of Carbon-14 Labelled Tobacco Constituents II. The Synthesis of D1-Nicotine (2'-14C)." J. Labelled Compounds IX(2): 253-259.	19730600	1000258673	1000258679
92.	Cox, Richard H., James Kao, Henry V. Secor, and Jeffrey I. Seeman. "Assessment of Isolated Electronic Effects on Conformation. NMR Analysis of Nicotine and Related Compounds and Ab Initio Studies of Model Compounds." J. of Molecular Structure 140: 93-106.	19850000	2047104915	2047104928
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128.	Accord kit and cigarettes	19980000		
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199.	Memorandum from Robert B. Seligman to F. Will, III, re: Determination of pH of Whole Tobacco Smoke and TPM	19690926	2050870969	
200.	Memorandum from F. Will, III, to Robert B. Seligman, re: pH of Whole Smoke of Cigarettes	19691017	2050870976	
201.	I. S. Osmalov et al: U.S. Patent No. 3,490,461, Cigarette Ventilation	19700120	2024986121	2024986127
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695.	GLP - Bescheinigung	19940209	2029261191	2029261192
696.	Moore, G.E., and Bock, F.G.,in "Tar and Nicotine Levels of American Cigarettes" Toward A Less Harmful Cigarette, National Cancer Institute Monograph 28, 89-94.	19680600		
697.	Memorandum from F. Ryan to W. McDowell regarding Pandora (Finger Occlusion).	19830113	2023091383	2023091385
698.	H.S. Diehl, M.D., Tobacco & Your Health: The Smoking Controversy, pp. 132-134.			
699.	Memorandum from E.B. Sanders and Jeffrey I. Seeman to Dr. Ulrich Hackenberg and Dr. Billmeier re: "Synthetic Compounds."	19790119	1000128805	1000128807
700.	Telex from "Ulrich" to Dr. T.S. Osdene, Director of Research, regarding inhalation study.	19771108	1002936511	1002936514
701.	Handwritten letter from "Rana" to "Tom," re: agenda and summary data.	19760000/E	1000137507	
702.	Telex from W. Reininghaus, re: Acute Toxicity Assay.	19771027	1002937099	1002937101
703.	Telex from J. Kuehl, "Ulrich," to Professor Dr. R. Rylander and carbon copied to Dr. R. Rylander, re: "45 D-Smoke Inhalation Study with Male Hamsters. Free Lung Cell Assays."	19790112	1002938904	1002938909
704.	Telex from M. Kuehl and "Ulrich," carbon copied to Dr. R. Rylander, Gothenburg, re: "24 D-Smoke Inhalation Study on Male Rats with 2R1 and MW Cigarettes and Nicotine Vapor, Added to Non-Tobacco Smoke."	19790706	1002939020	1002939042
705.	INBIFO telex re: "21-Day Inhalation Study with 2R1 Standard Reference Cigarettes and BVW Cigarettes on Rats."	19800611	2501618918	2501618939
706.	Telex from J. Kuehl, INBIFO, to "PM RD RCH" re: "23 D-Smoke Inhalation Study on Male Rats with 2R1 Cigarettes and Added Carbo Monoxide or Nitrogen Dioxide."	19790323	1002938915	1002938927
707.	Telex from W. Reininghaus to Jim Charles, re: "Nicotine Addition to Non-Tobacco Smoke."	19781215	1002973886	
708.	Letter from R.D. Carpenter to Dr. Ulrich Hackenberg, re: description of impaction trap.	19800501	1003121556	
709.	Telex from R.D. Carpenter to Dr. U. Hackenberg re: skin painting study.	19780207	1003121956	
710.	Letter from R.D. Carpenter to Dr. U. Hackenberg, re: skin painting study.	19780207	1003121957	
711.	Telex from R.D. Carpenter to Dr. W. Reininghaus, re: "Gas Phase Data for X6D90A.."	19790315/E	1003122768	
712.	Handwritten telex from Jim Charles to Dr. R. Mull, re: "Your Telex No. 2390 of Sept. 9, 1980."	19800912	1003170204	
713.	Telex from Dr. R. Mull to T.S. Osdene, re: skin painting studies	19800909	1003170205	1003170206
714.	Telex from Tom Osdene to Dr. Ulrich Hackenberg, re: skin painting study.	19790000/E	1003170276	
715.	Letter from Ulrich Hackenberg to T. S. Osdene re: Your Telex of	19770309	2501621966	

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DOCUMENTS RELIED UPON BY RICHARD CARCHMAN, PH.D.

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No.	Description	Date	Begin Bates	End Bates
	March 8, 1977.			
716.	Lists of INBIFO Publications.		2029169851	2029169883
717.	Memorandum from Jeffrey I. Seeman to Robert B. Seligman re: Nicotine Receptor Program - University of Rochester.	19800321	1000127796	1000127798
718.	Memorandum from E. B. Sanders to Robert B. Seligman re: Nicotine Receptor Program - University of Rochester.	19800321	1000127786	1000127788
719.	Memorandum from Frank P. Gullotta, et al. to H.L. Spielberg re: Phase I ART Study.	19900329	2025986581	2025986594
720.	Letter from T. S. Osdene to Dr. Ulrich Hackenberg.	19770300	2501621967	
721.	Memorandum from T.V. Hartnett	19531214	1005039779	1005039783
722.	Presentation by R.N. DuPuis "The Tobacco Industry--Background and Current Research" presented before the Metropolitan-Long Island Subsection, American Chemical Society Symposium on Tobacco	19560224	1001935597	1001935625
723.	Hans L. Falk, Ph.D., Herta M. Tremer, Ph.D., Paul Kotin, M.D., "Effect of Cigarette Smoke and Its Constituents on Ciliated Mucus-Secreting Epithelium," J. Nat. Cancer Inst. 23(5): 999-1012.	19591100		
724.	Lawton M.P., et al., "The Relationship Between Excessive Cigarette Smoking and Psychological Tension," Am J Med Sci 232(4): 397-402.	19560000		
725.	Press Release titled, "Philip Morris Multifilter - Dramatic Advance in Charcoal Filter Cigarettes - Introduced in Lexington".	19640319	2010020100	2010020102
726.	R. Fredereick Becker, J. Edward King and Chloe R. D. Little, "Experimental Studies on Nicotine Absorption During Pregnancy: IV. The postmature neonate," Am. J. Obst. & Gynec., 101(8): 1109-1119.	19680815		
727.	R. Frederick Becker, Chloe R. D. Little, and J. Edward King, "Experimental Studies on Nicotine Absorption in Rats During Pregnancy: III. Effect of Subcutaneous Injection of Small Chronic Doses Upon Mother, Fetus, and Neonate," Am. J. Obst. & Gynec., 100(7): 957-968.	19680401		
728.	R. Frederick Becker and J. Edward King, "Studies on Nicotine Absorption During Pregnancy: II. The effects of acute heavy doses on mother and neonates," Am. J. Obst. & Gynec., 95(4): 515-522.	19660615		
729.	C. Scott Russell, R. Taylor and C. E. Law, "Smoking in Pregnancy, Maternal Blood Pressure, Pregnancy Outcome, Baby Weight and Growth, and Other Related Factors: A Prospective Study," Brit. J. Prev. Soc. Med., (1968), 22 (3): 119-126.	19680000		
730.	N. Thuerauf, M. Kaegler, R. Dietz, A. Baroka, and G. Kobal, "Dose-Dependant Stereoselective Activation of the Trigeminal Sensory System by Nicotine in Man."	19980000	2502049622	2502049629
731.	Manuscript Review Board Information Sheet for CORESTA meeting, Innsbruck, Austria, 9/99, "The Effect of Ingredients Added to Tobacco in a Commercial Marlboro Lights Cigarette on FTC Nicotine Yield, 'Smoke pH', and Cambridge Filter Trapping Efficiency."	19990329	2063075652	
732.	Abstract by Cathy Ellis, et al., "The Effect of Ingredients Added to Tobacco in a Commercial Marlboro Lights Cigarette on FTC Nicotine Yield, 'Smoke pH', and Cambridge Filter Trapping Efficiency," 3/99 estimated.	19990300	2063075644	
733.	Report by G. Kobal, "Effects of Arousal on the Pattern Reversed Evoked Potential (P - / 5330)."	19981200	2501907764	2501907766
734.	"Study Indicates Use of Cigarettes is Major Cause of Lung Cancer Among Men," The New York Times, pg. 65.	19640112		

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No.	Description	Date	Begin Bates	End Bates
735.	Memorandum from R.D. Carpenter to Thomas S. Osdene re: All-Burley Cigarette.	19671127	1000306835	1000306837
736.	CORESTA Smoke & Technology Meeting Presentation given by Cathy Ellis in Innsbruck, Austria, 19990905-19990909.	19990900		
737.	Telex from R.A. Walk to T.S. Osdene re: recent meeting.	19820928	1000130304	
738.	Analytical Determination of Nicotine and Related Compounds and Their Metabolites, Gorrod, J.W., and Jacob, P. (eds), Elsevier, Amsterdam, pp. v-xiv, 1-758	19990000		
739.	Telex from U. Hackenberg to J. Charles re: 1979 budget.	19790326	2021569345	
740.	Letter from J. Ocy to R. Pages re: SCE prints.	19790719	1002979437	
741.	Telex from B. Viol to R.D. Carpenter re: experimental cigarettes.	19790417	1003122770	
742.	Telex from U. Hackenberg to R. Fagan re: animal models of human disease.	19740918	1002635068	
743.	Memorandum from Helmut Wakeham to J. Murphy re: acquisition of INBIFO	19700805	2022244454	
744.	Letter from E. Roemer to R. Pages re: Cocoa Paper	19870527	2021582897	
745.	Letter from E. Roemer to C. Liffy re: Determination of Tobacco-Specific N-Nitrosamines in Filler	19870327	2024842474	
746.	Scheppers, G. and Walk, R.A."Cotinine determination by immunoassays may be influenced by other nicotine metabolites,"Archives of Toxicology 62: 395-397.	19880000	2023458135	2023458137
747.	Telex to H. Wakcham from U. Hackenberg re: building a centre of excellance	19710616	2023131841	
748.	Voncken, P., Stinn, W., Haussmann, H.-J., Anskeit, E., "Influence of Aging and Surface Contact on the Composition of Cigarette Sidestream Smoke. Models for Environmental Tobacco Smoke," in: Dungworth, D.L., Mauderly, J.L., Oberdoerster, G. (eds): Toxic and Carcinogenic Effects of Solid Particles in The Respiratory Tract, Ilsi Press (Washington), pp. 637-641.	19940000	2028345056	2028345061
749.	Chart entitled "Ammonia Cigarette Study."	19980928/E	2063132259	
750.	Stellman, S.D. and Garfinkel, L. "Smoking Habits and Tar Levels in a New American Cancer Society Prospective Study of 1.2 Million Men and Women," JNCI 76(6): 1057-1063.	19860600		
751.	Tang, J.-L., Morris, J.K., Wald, N.J., Hole, D., Shipley, M., and Tunstall-Pedoe, H., "Mortality in Relation to Tar Yield of Cigarettes: A Prospective Study of Four Cohorts," BMJ 311: 1530-1533.	19951209		
752.	Petitti, D.B., and Friedman, G.D., "Respiratory Morbidity in Smokers of Low- and High-Yield Cigarettes," Preventive Medicine 14(2): 217-225.	19850300		
753.	Petitti, D.B., and Friedman, G.D., "Cardiovascular and Other Diseases in Smokers of Low Yield Cigarettes," J Chron Dis 38(7): 581-588.	19850000		
754.	Participants of the Fourth Scarborough Conference on Preventive Medicine, "Is There a Future for Lower-Tar-Yield Cigarettes?" The Lancet 2(8464): 1111-1114.	19851116		
755.	Testimony of Dr. W.C. Scott, President of the American Cancer Society, during the Federal Trade Commission Hearings.	19640300	1005110880	1005110884
756.	"Death From Cigarette-Related Cancer in the U.S. is Found to be Epidemic," Medical Tribune 8(92): 3.	1967 00 00	1005110876	
757.	"Persistent Smoker Advised on Hazards," New York Times	19680917	1005111062	
758.	Telex to J. Charles from W. Reininghaus re: your telexes of Jan. 6 (Dr. Osdene) and Jan. 12, 1977 discussing the shipment of	19770114	1002975478	

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No.	Description	Date	Begin Bates	End Bates
	experimental cigarettes			
759.	Telex to W. Reininghaus from J. Charles discussing the shipment of experimental cigarettes	19770112	2024467791	
760.	Telex to W. Reininghaus from T. Osdene discussing the shipment of experimental cigarettes	19770106	2024467803	
761.	Telex to U. Hackenberg from T. Osdene re: Telex 857 of Dec. 23, 1976 and Telex 866 of Dec. 24, 1976 discussing upcoming study.	19761228/E	1002975471	
762.	Telex to J. Charles from U. Hackenberg discussing the date a study is to begin.	1976 12 24	1002975472	
763.	Telex to J. Charles from W. Reininghaus requesting experimental cigarettes for upcoming study.	1976 12 23	1002975473	
764.	Telex to J. Charles from W. Reininghaus requesting experimental cigarettes for upcoming study.	1976 12 23	2025996858	
765.	Telex to W. Reininghaus from J. Charles communicating smoke data and assurance to ship cigarettes for study.	19771222	2024467438	
766.	Russell, M.A.H., "Safer Cigarettes," Letter to the Editor, British Medical Journal 3(5974): 41.	19750705		
767.	Thornton, R.E. and S.R. Massey. "Some Effects of Adding Sugar to Tobacco." Beitrage zur Tabakforschung 8(1):11-15	19750100		
768.	Philpots, D.E., D. Spincer, and D.T. Westcott. "The Effect of Natural Sugar Content of Tobacco Upon the Acetaldehyde Concentration found in Cigarette Smoke." Beitrage zur Tabakforschung 8(1):7-10	19750100		
769.	Kusama, Massayoshi, Hirohiko Sakuma and Shiro Sugawara. "Low Boiling Compounds in Cellulose Cigarette Smoke." Agric. Biol. Chem. 42(2):479-481	19780000		
770.	McLaughlin, Shawn D., B. Keyes Scott and Charles M. Peterson. "The Effect of Cigarette Smoking on Breath and Whole Blood-Associated Acetaldehyde." Alcohol 7:285-287	19900000		
771.	Pomerleau, Ovide F. "Neurobiological Interactions of Alcohol an Nicotine. In: Research Monography No, 30, Alcohol and Tobacco: From Basic Science to Clinical Practice. Eds. Joanne B. Fertig and John P. Allen. Washington, D.C.: National Institutes of Health. 145-158.	19950000		
772.	Zimatkin, Sergey M. and Deitrich, Richard A. "Ethanol metabolism in the brain." Addiction Biology 2:387-399	19970000		
773.	Jenkins, R.W., Jr., M.K. Chavis, R.H. Newman and F.A. Morrell. "The Quantitative Recovery of Smoke from Radioactively Labeled Cigarettes." Internat. J. Applied Radiation and Isotopes 22(0): 691-697	19710000		
774.	Houseman, T.H. "Studies of Cigarette Smoke Transfer Using Radioisotopically Labelled Tobacco Constituents." Beitrage zur Tabakforschung 7(3):142-147	19730000		
775.	Stevens, Nanette A. and Michael F. Borgerding. "GC-AED Studies of Nicotine Fate in a Burning Cigarette." Anal. Chem. 77(11):2179-2185	19900000		
776.	Memorandum from Elizabeth Chambers to J.E. Wickham re: "National POL 0296 (Requested by B. Hendricks)."	19900107	2023107918 2023107919 2023107920	
777.	POL Memo 0296	19910225	2023108908	2023107913
778.	POL Memo 0558	19910321	2024001958	2024001962
779.	ART Program Project Half-Nic	19910419/E	2023107824	2023107833

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March 15, 2000

No.	Description	Date	Begin Bates	End Bates
780.	POL Memo 05012	19920608	2023286822	2023286825
781.	Seeman, Jeffrey I., John P. Baine III. "The Form of Nicotine in Tobacco. Thermal Transfer of Nicotine and Nicotine Acid Salts to Nicotine in the Gas Phase." Journal of Agricultural and Food Chemistry 47(12): 5133-5145.	19990000		
782.	Robbins, Lewis C. "Medical Practice and Lung Cancer." Minnesota Medicine 45(0): 131-135.	19620200		
783.	List of Philip Morris Scientific Publications	19540000 19970000		

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AUG 3 1992
Ken Houghton

PHILIP MORRIS U.S.A.

INTER-OFFICE CORRESPONDENCE

Richmond, Virginia

CONFIDENTIAL

To: Dr. K. S. Houghton Date: August 3, 1992

From: J. L. Charles

Subject: Termination of the PMT Project

In the fourth quarter of 1991, PM-USA Operations began a restructuring process designed to reduce/eliminate redundancy by identifying those activities that were essential to our core business of cigarette manufacturing. A review of all research activities at PM-USA R&D, PME R&D, and INBIFO was immediately undertaken. A number of redundancies in research were identified and assignments were made at the three labs to reduce redundancy and to reduce headcount. To date three positions exclusive of the PMT project have been eliminated, others have been identified and will be eliminated shortly.

In this overall context, the PMT project was also evaluated. The objectives of the PMT project were to use a genetic engineering/biotechnology approach to determine if a tobacco plant could be produced with dramatically reduced nicotine content while maintaining subjective and agronomic quality. Further, such a plant could be useful in studying the possible relationship between nicotine and NNK, a tobacco specific nitrosamine. It has been reported in the literature that nicotine is a direct precursor of NNK. In-house PM data does not agree with the literature report. The proof of the relationship (or absence of a relationship) could be tested if a tobacco plant with no nicotine could be produced. The presence of endogenous NNK in a tobacco plant that contained no nicotine would be proof that nicotine is not a direct precursor of nicotine. To date our best efforts have yielded a plant with a 80% reduction of nicotine and we have not determined that this is in fact due to PMT activity reduction. The bottom line is that our substantial progress over the past several years has not been sufficient to address the question of whether nicotine is or is not a direct precursor of NNK.

We realized early on that a successful biotechnology altered tobacco plant could not be introduced into commerce by PM. Instead, we envisioned that at some point we would have to transfer the technology to a land grant university for implementation. A review of the technology by R. Kinser (Section Leader), R. Carchman (Manager, Biochemical Research), C. Ellis (Director, Applied Research) and J. Charles (V.P., Research) resulted in a decision to terminate the PMT project by completing the work necessary to prepare a patent application to protect PM's interests in this technology. The target date to complete the work was December 31, 1992. We determined that certain positions would be required to complete the patent application and those positions not required would be eliminated.

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On June 9, 1992, I informed Malik, Turner, Nakatani, Yu, Davies, and Powell that management had decided to terminate the PMT project and that their positions had been eliminated effective end of business July 16, 1992. Richard Carchman and Valerie Bowles were present when I notified each individual that his/her position had been eliminated.

In summary, the PMT work has been terminated because of management decision that the probability of success is sufficiently low that the PMT project does not qualify as being essential to our core business of cigarette manufacturing. Further, the positions eliminated were occupied by individuals with a "meets expectations" performance appraisal and their skills were determined not to be critical to the success of a restructured PM-USA Operations and Research function. Sometime after our patent position has been secured, we will consider transfer of this technolgoy to a land grant university.

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